ENG

REGULATORS AND PROGRAMMERS

GEFRAN

BEYOND TECHNOLOGY


IC13
IC2
IGND
TP1
IC32
S5
J10
R252
R251
R242
R241
J14
IC28
IC29
IC7
IC36
G1
S4
J12

GEFRAN

BEYOND TECHNOLOGY

More than fifty years of experience, an organisation with a strong focus on the customer's needs and constant technological innovation have made Gefran a benchmark in the design and production of sensors, systems and components for industrial process automation and control. Expertise, flexibility and process quality are the factors that distinguish Gefran in the production of integrated tools and systems for specific applications in various fields of industry, with consolidated know-how in the plastics, mobile hydraulics, heating and lift sectors.

Technology, innovation and versatility represent the catalogue's added value, in addition to the ability to create specific application solutions in association with the world's leading machine manufacturers.

GEFRAN
BEYOND TECHNOLOGY

Thanks to its consolidated experience in providing process control instruments and an intense research and development program, Gefran offers a series of solutions for all applications requiring accurate and safe PID control. Actions needed to address today's challenges in various sectors of industry.

Gefran offers a wide range of products that are scalable in both performance and features.
PID controllers are designed with a special focus on ease of use and configuration. LCD touchscreen displays provide clear and immediate information on process status and ensure safe operation.

Not only PID regulation but connectivity, remote diagnostics, predictive maintenance, energy counting and integrated control logic. These are just some of the additional features that allow devices to communicate in an automation architecture and make decisions independently, basing their actions on the process data available to them, turning them into intelligent components.

APPLICATION SECTORS

AUTOMOTIVE

AEROSPACE / AERONAUTICS

STERILIZATION

INDUSTRIAL FURNACES

MEDICAL / LABORATORIES

HEAT EXCHANGERS

GLASS PRODUCTION

INDUSTRIAL BOILERS

PACKAGING

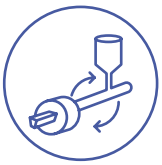
CHILLERS

PRINTING MACHINES

CLIMATE CELLS

BATCH PROCESSES

PHARMACEUTICAL



PLASTIC EXTRUSION

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BEYOND TECHNOLOGY

FULLY CUSTOMIZABLE

The new Value and Performance series LCD displays are among the largest and most complete HMIs available in this segment.
The appearance of the front panel is highly customizable, adapting the controller to the application needs and integrating perfectly with the machine control requirements.

CUSTOM LABELLING

Potential for customization with the builder's logo.

FRAME

Front panel with customizable colour and graphics.

MESSAGES ON DISPLAY

Up to 75 messages with customized scrolling, up to 32 characters in 3 different languages.

DISPLAYS

Three large displays for measurement (PV), setpoint (SP) and configurable values.

KEY

4 or 6 mechanical keys with silicone cover providing visual and tactile pressure feedback.

BARGRAPHS

Up to 3 bargraphs, customizable in number and display.

CLEAR, IMMEDIATE ALPHANUMERIC MESSAGES

Value and Performance series controllers use more than 300 text messages in English describing menus and configuration parameters, permitting easy and intuitive configuration even without the manual.

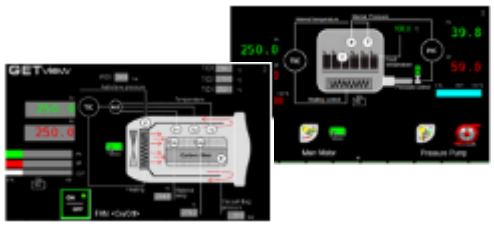
Up to 75 customised messages can be created, each consisting of 32 Latin characters and numbers, saving them in 3 different languages. Messages can be associated with alarms, external events from digital inputs and programmer segments.

MULTIFUNCTION SERIES

A large colour touchscreen display makes the graphic interface even simpler and more intuitive.

GETview

This function lets users build man-machine interface pages directly from the touchscreen.



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EFFICIENT AND SCALABLE
PID REGULATORS

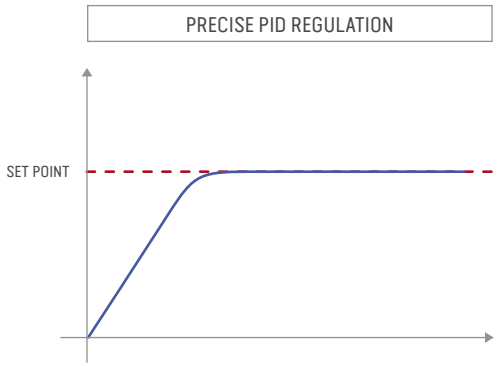
Thanks to precise closed-loop control algorithms, Gefran's PID controllers guarantee the stability and precision of temperature and other quantities, avoiding overshoots and oscillations, even in the presence of critical or very rapid processes.

AMS2750 / CQI-9

In the heat treatment of materials, used in sectors such as aerospace and automotive, specific characteristics of control, precision and data storage are required. The Performance and Multifunction series comply with AMS2750 and CQI-9.

AUTOTUNING

The regulators are equipped with an efficient tuning algorithm that ensures stable and accurate temperature control, avoiding overshoot and oscillation, even in critical or very rapid thermal processes.

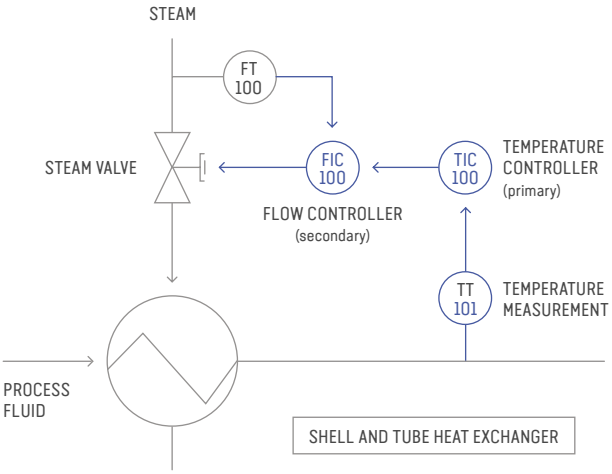


CASCADE AND RATIO CONTROL

Cascaded regulation is a system with two inputs and one output, with two nested PIDs, the first of which provides the setpoint to the second control loop.

This type of control ensures greater stability in adjustment, reducing the margin of error between measured and desired value.

If, on the other hand, one quantity must be controlled on the basis of another, maintaining a constant ratio between the two (for example, when mixing two fluids), the solution is ratio control.



EXAMPLES OF CASCADE CONTROL

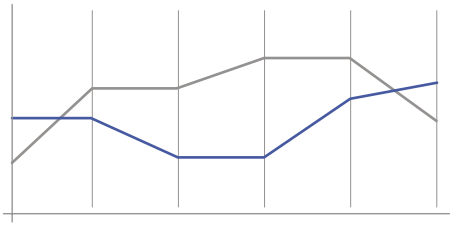
SIMPLE AND VERSATILE PROFILE GENERATOR

Heat treatment processes typically require changing the setpoint over time for one or more PID control loops.

The profile generator with ramp and maintenance permits simple configuration of set point profiles and programming of the associated events. It can be programmed online directly on the controller or offline with the GF_eXpress configuration tool.

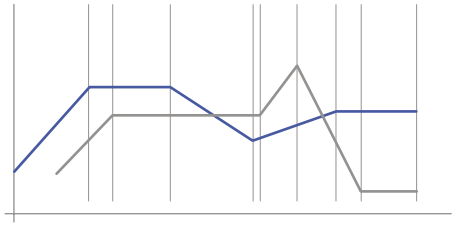
SYNCHRONOUS PROFILE MANAGEMENT

All setpoint profiles have the same time base.



ASYNCHRONOUS PROFILE MANAGEMENT

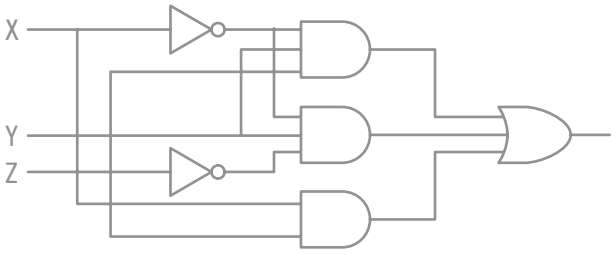
Setpoint profiles have different time bases.

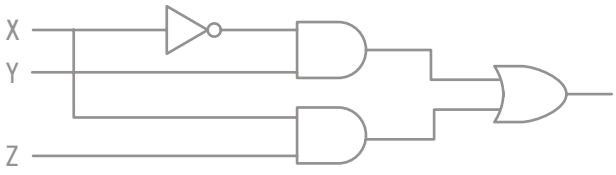


MATHEMATICAL AND LOGICAL FUNCTIONS

The library of logic blocks (AND, OR, NOT, TIMER) permits creation of logic and control interlocks with events from digital inputs or from internal regulator status conditions. Mathematical functions are useful for calculating averages and differences, selecting min/max values, extracting square roots and calculating algorithms on analogue input and output variables.

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





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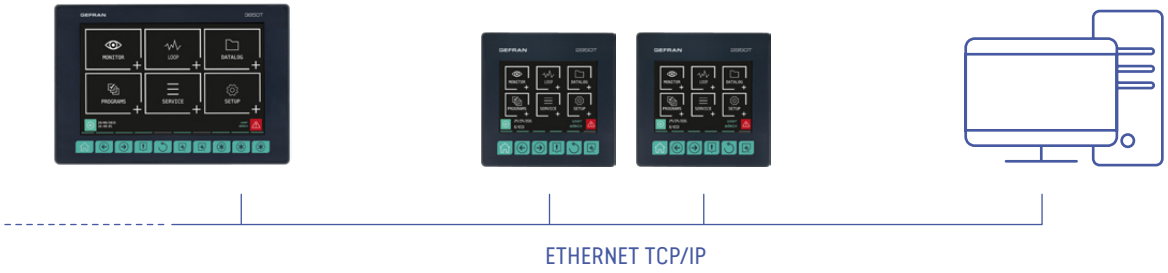
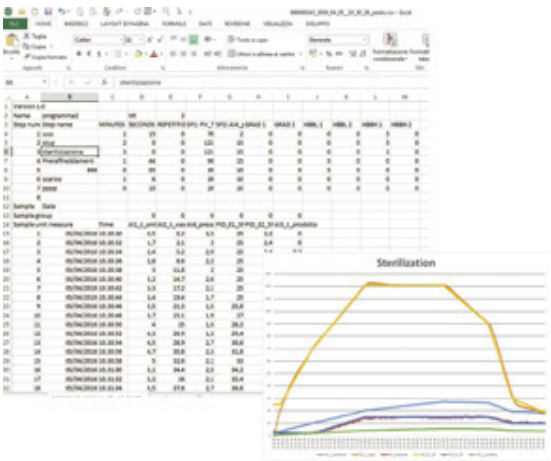
DATALOG AND BATCH REPORT

The Datalog and Batch Report function available with the Multifunction series in combination with the Real Time Clock (RTC) allows you to store process data, In/Out event status and alarms in standard files (.CSV) or in encrypted format. Data stored in the form of a batch report can be used to produce production reports or quality reports.



REMOTE REVIEW AND SAVING OF ARCHIVED DATA

The Report Utility software allows you to automatically copy and delete (at configurable time intervals) archive files stored by Multifunction controllers connected in the Ethernet TCP/IP network.
Data transferred to a PC can be used to recreate trend graphs or tabular spreadsheets (.csv) or for printing. In the case of secure (encrypted) data archive, this tool keeps the original format intact by creating copies useful for subsequent analysis by exporting them into the standard .csv or .pdf format.



TIME SYNCHRONIZATION (SNTP)

To accurately store date /time values for the datalog archive data, the controller supports the Standard Network Time Protocol (SNTP) service. The SNTP service automatically updates controller date/time by connecting to an SNTP server connected via an Ethernet network.

PREVENTIVE MAINTENANCE AND ENERGY MONITORING

The energy monitoring function allows the operator to count and save the amount of power consumed by a process. In the event of deviation from average consumption, the regulator can signal the anomaly by activating a physical output with customized messages. The preventive maintenance function monitors and controls the life cycle of the actuators, indicating when the limit on use is reached.

ENERGY MONITORING

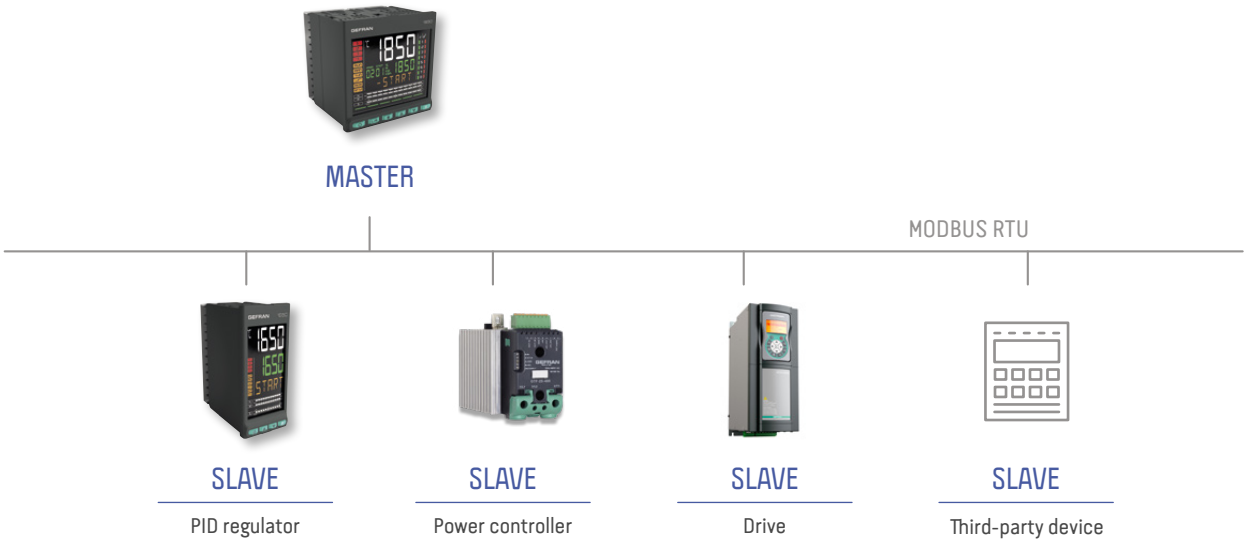
Measures and controls the energy consumption of the system. Checks and reports if the system exceeds the expected values.

PREVENTIVE MAINTENANCE

Counts power-on cycles and indicates when the life cycle limit has been reached with alarm messages.

MODBUS MASTER

More and more often it is necessary to integrate different devices within a process control.
The easiest and fastest way is to use Modbus Master communication available on the Performance series, allowing reading/writing of data from different Modbus Slaves and using the controller display as an efficient HMI.



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CONFIGURATION SOFTWARE

GF_eXpress is the software for the configuration/ parameterization of all GEFRAN devices (components, automation products, drives and sensors).

The selection and parameterization of the device is simple and intuitive thanks to a completely graphic interface.

KEY FEATURES

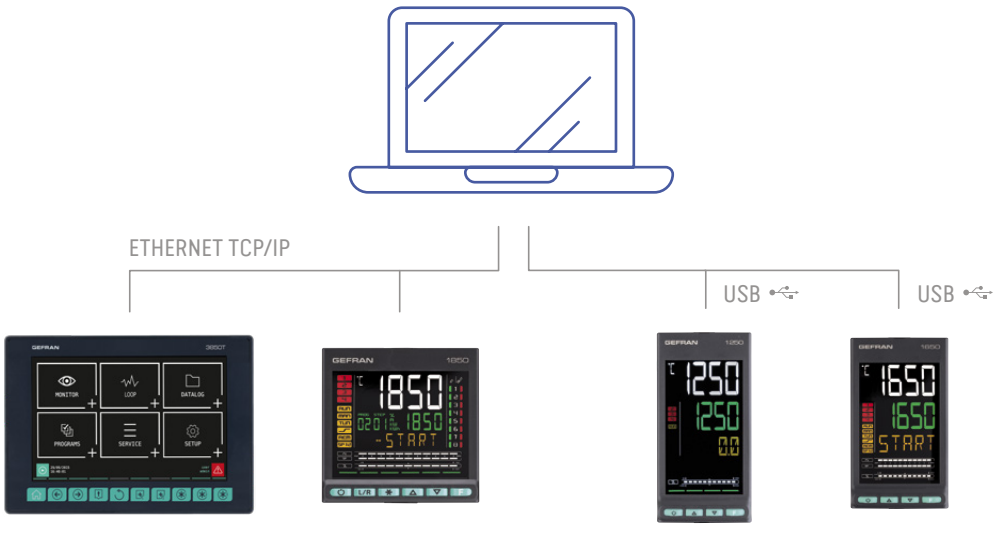
- Guided product selection
- Simplified configuration
- Multilingual
- Parameter printout
- Creating and saving configurations
- Device autoscan
- Value trends and logging

CONTROL LOGIC

Graphic interface with on-line diagnostics for the configuration of control logic and mathematical functions.

CUSTOM PAGE

Easy and intuitive configuration of the custom graphic interfaces available on the Multifunction Series.



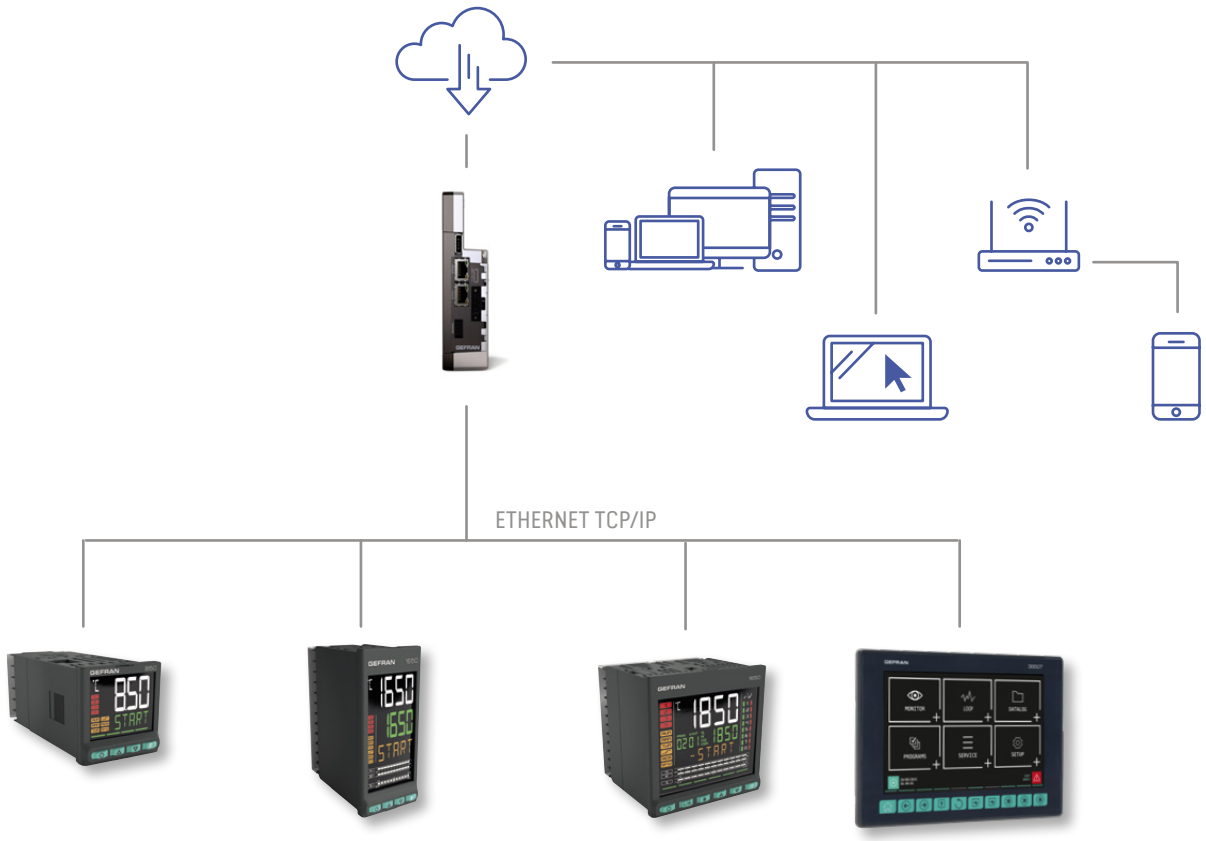
CONNECTIVITY

FACTORY INTEGRATION AND SYSTEM DIAGNOSTICS

Performance and Multifunction series controllers can be connected to centralized acquisition or control systems such as HMI or DCS for integration into factory automation. This service is available with an Ethernet TCP / IP connection based on the standard Modbus TCP protocol.

REMOTE ASSISTANCE AND MAINTENANCE

The the system may be accessed remotely via PC, tablet or smartphone with a Webserver (Performance series) or standard VNC service (Multifunction series). In the event of a failure or maintenance, controllers provide clear diagnostics, such as failure, disconnected load, out of scale, etc.



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BASIC SERIES

THE ESSENTIAL REGULATOR

Four different models for multiple temperature control applications in industrial processes. Simplicity and practicality are combined with the experience of PID regulation.

- Operator interface with double LED display
- Universal input
- Hot, cold and hot/cold PID settings with automatic tuning
- Interrupted, total and partial load alarm
- Loop Break Alarm
- Up to four relay outputs, logic for SSR
- Analogue control and retransmission outputs
- RS485 serial communication in Modbus RTU
- Dimensions 1/16, 1/8, 1/4 DIN

450

600

1200

1300

VALUE SERIES

SIMPLICITY IN REGULATION

Innovative PID temperature controllers and programmers that add the broadest, clearest and most comprehensive operator interfaces to accuracy of control for a totally "easy to use" approach.

- Customizable alphanumeric messages that "speak to the operator", in his own language
- Customization of colours, lettering, logo
- Extensive and comprehensive operator interface, at the top of its category in every format
- Configuration facilitated by Quick Configuration and online help with scrolling messages
- Preventive diagnostics with KWh counts and number of actuator manoeuvres
- Configurable logic functions ready to use
- Setpoint programmer and motorized valve positioner
- Dimensions 1/16, 1/8, 1/4 DIN

650

1250

1350

PERFORMANCE SERIES

THE REGULATOR FOR ALL NEEDS

For the most demanding control applications, where the regulator must "think" before it acts.

- Two independent PID control loops
- AMS2750 / CQI-9 compliant
- 3 fully configurable analogue inputs
- Valve control with feedback
- Two independent Setpoint profiles (Synchronous / Asynchronous)
- Logical and mathematical functional blocks
- Cascade and Ratio PID control
- Web server
- Modbus RTU/TCP slave
- Modbus RTU master
- Preventive diagnostics with counter of the number of actuator commands
- Energy Totalization (KWh)
- Storage of work recipes
- Multilingual alphanumeric messages

850

1650

1850

MULTIFUNCTION SERIES

BEYOND REGULATION

Gefran's top-of-the-range regulators include models with specific functions suitable for solving complex process and application requirements.

- 2500 Series for ultra-rapid pressure and force adjustments
- Multifunction 2850T and 3850T series graphic touchscreen regulators with multi-loop process control function, setpoint profile generator, multi-channel recorder and integrated logic/mathematical algorithms
- GFXTERM04 Series for PID adjustments of four independent zones and full range of Fieldbuses of ultra-compact size

2500

GFXTERM04

2850T

3850T

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BEYOND TECHNOLOGY

BASIC, VALUE, PERFORMANCE AND MULTIFUNCTION SERIES

SIMPLE, FOR ALL NEEDS

BASIC

450

600

1200

1300

PID
1 LOOP

VALUE

650

1250

1350

PID
1 LOOP

VALVES

SP PROFILE

LOGIC

PERFORMANCE

850

1650

1850

PID
2 LOOP

VALVES

SP PROFILE

LOGICAL

RATIO

CASCADE

REMOTE CONNECTION

MATHEMATICAL

MULTIFUNCTION

2500

- 1 LOOP
- HIGH SPEED
- 4 ANALOG INPUTS
- MATHEMATICAL

GFXTERM04

- 4 PID LOOPS
- 8 TC INPUTS
- DIN BAR FITTING
- FIELDBUS COMMUNICATION
- MODBUS RTU

2850T

3850T

- UP TO 16 LOOPS.
- DATA RECORDER
- VALVES
- LOGICS
- SP PROFILE
- CASCADE
- RATIO
- REMOTE CONNECTION

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	BASIC SERIES		VALUE SERIES	PERFORMANCE SERIES	
	SINGLE LOOP			DUAL LOOP	
	DOUBLE DISPLAY		DOUBLE/TRIPLE DISPLAY		
			REGULATORS VALVES PROGRAMMERS		
	Modbus RTU			Modbus TCP/RTU	
198x134 mm					
96x96 mm (1/4 DIN)		 1300	 1350	 1850	
48x96 mm (1/8 DIN)		 1200	 1250	 1650	
48x48 mm (1/16 DIN)	 450	 600	 650	 850	
25x140x140 mm (DIN rail)					

MULTIFUNCTION SERIES

	SINGLE LOOP	MULTILOOP			
	TRIPLE DISPLAY	LCD DISPLAY, GRAPHIC TOUCHSCREEN			
	HIGH SPEED	REGULATORS, PROGRAMMERS, RECORDER, CONTROL LOGIC		DIN RAIL FIXING REGULATORS, 4 LOOPS	
	Modbus RTU PROFIBUS	Modbus TCP		MULTI FIELDBUS	
			 3850T		198x134 mm
	 2500	 2850T			96x96 mm (1/4 DIN)
					48x96 mm (1/8 DIN)
					48x48 mm (1/16 DIN)
				 GFXTERM04	25x140x140 mm (DIN rail)

MULTIFIELDBUS	PROFINET	PROFIBUS	DeviceNet	EtherNet/IP	Modbus TCP/RTU	EtherCAT	CANopen

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SELECTION GUIDE

	BASIC				VALUE		
	450	600	1200	1300	650	1250	1350
MAIN FEATURES							
Format	48x48mm (1/16 DIN)	48x48mm (1/16 DIN)	48x96mm (1/8DIN)	96x96mm (1/4DIN)	48x48mm (1/16 DIN)	48x96mm (1/8DIN)	96x96mm (1/4DIN)
No. of control loops (max.)	1	1	1	1	1	1	1
OPERATOR INTERFACE							
DISPLAY							
Double LED display	X	X	X	X			
Triple LED display							
Double LCD display					X		
Triple LCD display						X	X
Bargraph						X	X
LCD graphic touchscreen							
Alphanumeric messages					X	X	X
Scrolling alphanumeric messages					X	X	X
KEYBOARD							
No. of keys	4	4	4	4	4	4	6
INPUTS							
MAIN INPUTS							
TYPE OF SENSOR							
Inputs from temperature sensors (TC, RTD)	X	X	X	X	X	X	X
Inputs from infrared temperature sensors					X	X	X
Linear inputs (mV,V,mA)		X	X	X	X	X	X
Inputs from pressure and force sensors (4-wire, 6-wire)							
Inputs from position sensors (potentiometers, magnetostrictive)							
ACCURACY							
Accuracy 0.5% (f.s.)							
Accuracy 0.2% (f.s.)	X	X	X	X	X	X	X
Accuracy 0.1% (f.s.)					X (In Linear)	X (In Linear)	X (In Linear)
SAMPLING TIME							
120ms	X	X	X	X	X	X	X
60ms					X	X	X
20ms							
2ms							
AUXILIARY INPUTS							
AT (amperometric) inputs		X	X	X	X(2)	X(2)	X(2)
Input from remote setpoint (V, mA)					X	X	X
Valve position feedback inputs (4-20mA, potentiometer)							
Inputs from temperature probes							
Auxiliary input insulation							
DIGITAL INPUTS							
No.		X (1)	X (2)	X (2)	X (3)	X (5)	X (5)
OUTPUTS							
Relays (R)	X (2)	X (4)	x (4)	X (4)	X (4)	X (4)	X (4)
Logic (D)	X (1)	X (2)	X (3)	X (3)	X (2)	X (2)	X (2)
Triac (T)		X (1)	X (1)	X (1)	X (1)	X (1)	X (1)
Analogue (V, mA) (C, W)		X (1)	X (1)	X (1)	X (2)	X (2)	X (2)
Analogue output insulation					X	X	X
Total No. Outputs (max)	2	4	4	4	5	5	5

Note: The figures between ( ) represent the maximum permitted values

	PERFORMANCE			MULTIFUNCTION			
	850	1650	1850	2500	2850T	3850T	GFXTERM04
MAIN FEATURES							
Format	48x48mm (1/16 DIN)	48x96mm (1/8DIN)	96x96mm (1/4DIN)	96x96mm (1/4DIN)	96x96mm (1/4 DIN); 169x120mm	198x134mm	25x140x140mm
No. of control loops (max.)	2	2	2	1	8	16	4
OPERATOR INTERFACE							
DISPLAY							
Double LED display							
Triple LED display				X			
Double LCD display	X						
Triple LCD display		X	X				
Bargraph		X (3)	X (3)	X(2)	X	X	
LCD graphic touchscreen					X	X	
Alphanumeric messages	X	X	X		X	X	
Scrolling alphanumeric messages	X	X	X				
KEYBOARD							
No. of keys	4	4	4	6	6	10	
INPUTS							
MAIN INPUTS							
TYPE OF SENSOR							
Inputs from temperature sensors (TC, RTD)	X	X	X	X	X	X	X
Inputs from infrared temperature sensors	X	X	X				
Linear inputs (mV,V,mA)	X	X	X	X	X	X	X
Inputs from pressure and force sensors (4-wire, 6-wire)				X	X	X	
Inputs from position sensors (potentiometers, magnetostrictive)				X	X	X	
ACCURACY							
Accuracy 0.5% (f.s.)							
Accuracy 0.2% (f.s.)					X	X	X
Accuracy 0.1% (f.s.)	X	X	X	X			
SAMPLING TIME							
120ms	X	X	X				X
60ms	X	X	X				
20ms					X	X	
2ms				X			
AUXILIARY INPUTS							
AT (amperometric) inputs	X(2)	X(2)	X(2)		X(4)	X(8)	X
Input from remote setpoint (V, mA)	X	X	X	X	X	X	
Valve position feedback inputs (4-20mA, potentiometer)	X	X	X		X	X	
Inputs from temperature probes	X (2nd loop)	X (2nd loop)	X (2nd loop)	X (1)	X (8)	X (16)	X (4)
Input insulation	X	X	X				
DIGITAL INPUTS							
No.	X (3)	X (5)	X (5 + 8)	X (8)	X (32)	X (48)	X (2)
OUTPUTS							
Relays (R)	X (4)	X (4)	X (4 + 8)	X (4)			X (6)
Logic (D)	X (4)	X (4)	X (4 + 8)		X (32)	X (48)	X (8)
Triac (T)	X (1)	X (1)	X (1)				X (4)
Analogue (V, mA) (C, W)	X (2)	X (3)	X (3)	X (3)	X (4)	X (8)	X (4)
Analogue output insulation	X	X	X	X			
Total No. Outputs (max)	5	6	22	11	32	48	10

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SELECTION GUIDE

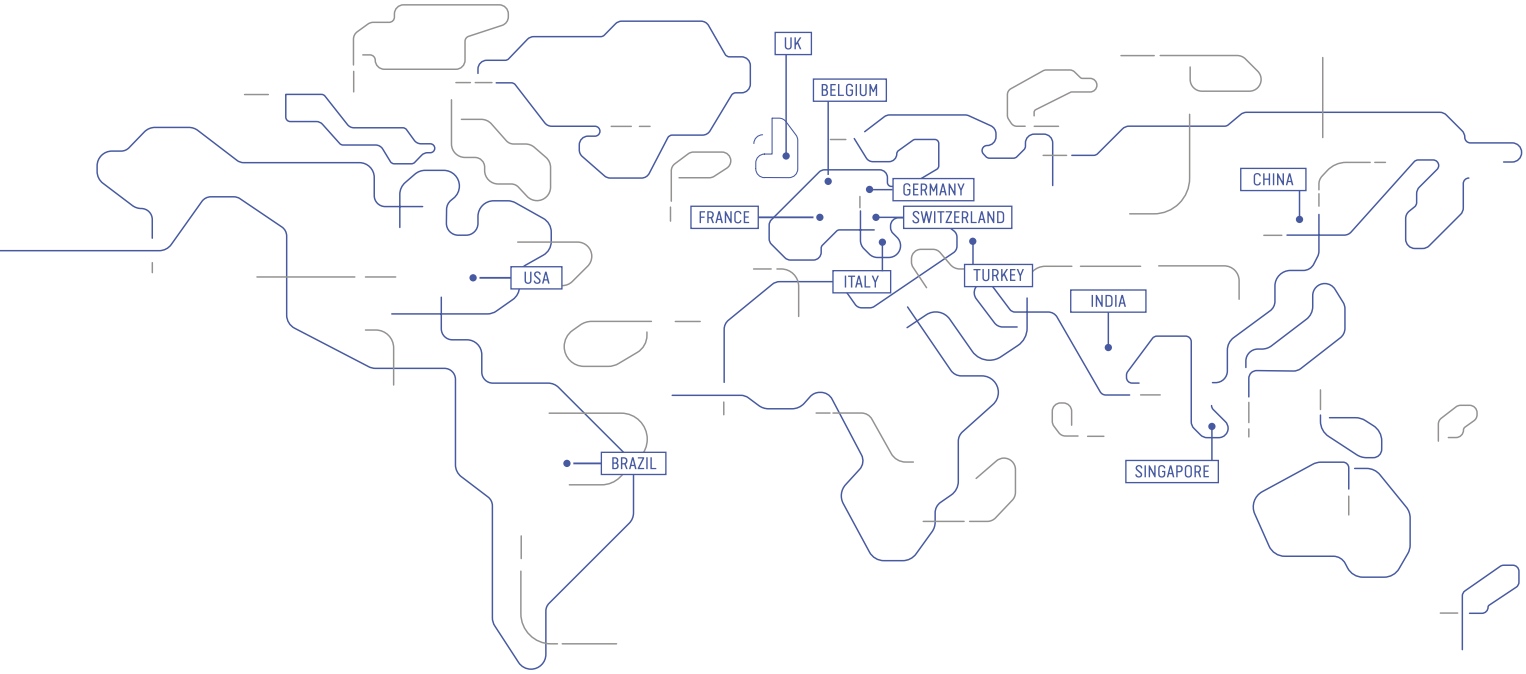
	BASIC				VALUE		
	450	600	1200	1300	650	1250	1350
CONTROL FUNCTIONS							
CONTROL							
PID single action hot, PID single action cold	X	X	X	X	X	X	X
PID double action hot/cold		X	X	X	X	X	X
Dual PIDs (cascade, ratio, independent control)							
PID parameter groups					X	X	X
Self Tuning / Auto Tuning	X	X	X	X	X	X	X
Control outputs for motorized valves					X	X	X
Control outputs for motorized valves (with valve position feedback)							
Setpoint programmer					X	X	X
Number of programmers					1	1	1
Number of programs					4	4	4
Number of steps					12	12	12
Mathematical functions							
Data Logger							
Real Time Clock							
Multiple setpoints		X (2)	X (2)	X (2)	X (4)	X (4)	X (4)
Logical Operations (Function Blocks)					X (16)	X (16)	X (16)
Timer function					X	X	X
Mathematical functions					X	X	X
Energy counter / Totalizer					X	X	X
DIAGNOSTICS							
Main input probe short circuit ("LBA")	X	X	X	X	X	X	X
Auxiliary input probe short circuit ("LBA")							
Disconnected load (total and partial) (" HB")		X	X	X	X	X	X
Actuator short circuit (e.g. ssr)		X	X	X	X	X	X
Number of switching outputs counters					X (4)	X (4)	X (4)
REMOTE CONNECTION							
Ethernet							
FIELDBUS							
Modbus RTU		X	X	X	X	X	X
Profibus							
Profinet							
CanOpen							
DeviceNet							
Modbus TCP							
Ethernet IP							
EtherCAT							
Configuration with GF_eXpress	X	X	X	X	X	X	X
Configuration without power supply					X	X	X
Stored processing recipes							
GENERAL DATA							
Operating temperature	0…50°C	0…50°C	0…50°C	0…50°C	-10…55°C	-10…55°C	-10…55°C
VOLTAGE							
100-240Vac	X	X	X	X	X	X	X
11-27Vac/dc	X	X	X	X			
20-27Vac/dc					X	X	X
24Vdc							
Auxiliary power supply (for transmitter, potentiometer)							
Front protection	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65
CERTIFICATIONS							
CE	X	X	X	X	X	X	X
UL	X	X	X	X	X	X	X
FM					X	X	
EAC	X	X	X	X	X	X	X

Note: The figures between ( ) represent the maximum permitted values
* Number of profiles per programmer

	PERFORMANCE			MULTIFUNCTION			
	850	1650	1850	2500	2850T	3850T	GFXTERM04
CONTROL FUNCTIONS							
CONTROL							
PID single action hot, PID single action cold	X	X	X	X	X	X	X
PID double action hot/cold	X	X	X	X	X	X	X
Dual PIDs (cascade, ratio, independent control)	X	X	X		X	X	
PID parameter groups	X	X	X	X	X	X	
Self Tuning / Auto Tuning	X	X	X	X	X	X	X
Control outputs for motorized valves	X	X	X		X	X	
Control outputs for motorized valves (with valve position feedback)	X	X	X		X	X	
Setpoint programmer	X	X	X		X	X	
Number of programmers	2	2	2		4 (4)*	8 (4)*	
Number of programs	16	16	16		200	250	
Number of steps	192	192	192		2000	4000	
Mathematical functions	X (8)	X (8)	X (8)	X	X (200)	X (200)	
Data Logger					X	X	
Real Time Clock	X	X	X		X	X	
Multiple setpoints	X (4)	X (4)	X (4)		X	X	X (2)
Logical Operations (Function Blocks)	X (32)	X (32)	X (32)		X (200)	X (200)	
Timer function	X	X	X		X	X	
Mathematical functions	X	X	X		X	X	
Energy counter / Totalizer	X	X	X		X	X	
DIAGNOSTICS							
Main input probe short circuit ("LBA")	X	X	X	X	X	X	X
Auxiliary input probe short circuit ("LBA")	X	X	X	X	X	X	
Disconnected load (total and partial) (" HB")	X	X	X		X	X	X
Actuator short circuit (e.g. ssr)	X	X	X		X	X	X
Number of switching outputs counters	X (4)	X (4)	X (4)				
REMOTE CONNECTION							
Ethernet	X	X	X		X	X	
FIELDBUS							
Modbus RTU	X(Master/Slave)	X(Master/Slave)	X(Master/Slave)	X			X
Profibus				X			X
Profinet							X
CanOpen							X
DeviceNet							X
Modbus TCP	X	X	X		X	X	X
Ethernet IP							X
EtherCAT							X
Configuration with GF_eXpress	X	X	X	X	X	X	X
Configuration without power supply	X	X	X				
Stored processing recipes	X	X	X	X	X	X	
GENERAL DATA							
Operating temperature	-10…55°C	-10…55°C	-10…55°C	0…50°C	0…50°C	0…50°C	0…50°C
VOLTAGE							
100-240Vac	X	X	X	X			
11-27Vac/dc							
20-27Vac	X	X	X	X			
24Vdc					X	X	X
Auxiliary power supply (for transmitter, potentiometer)	X (2)	X (2)	X (2)	X (2)	X	X	
Front protection	IP 65	IP 65	IP 65	IP 54	IP 65	IP 65	IP20
CERTIFICATIONS							
CE	X	X	X	X	X	X	X
UL	X	X	X	X	X	X	X
FM							
EAC				X			X

CODE 81130F

FM 608910



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