

TÜV type approval

CE 0085 AS 0254

DIN DVGW Test Mark NG-2510 AS 0324

## Advantages:

- Burner control
- Electronical compound, up to 5 channels
- Universal field bus to interface process control
- PC/Modem-interface
- Integrated load controller
- Integrated leakage test
- Integrated O<sub>2</sub>-/CO-controller
- Sliding controlled fuel changed
- Simultaneous combustion of 2 fuels with variable mixture ratio
- Blow out of the burner lance



One thing is of primary importance for modern firing installations: efficiency. That applies to the operation of the equipment as well as to its erection and commissioning.

**LAMTEC has the right solution:  
The Combustion Management System FMS**

It combines the advantages of an electronic firing compound with up to 5 positioning elements with an electronic burner sequence control. Since a burner firing rate control, O<sub>2</sub> control and leakage test are also integrated, and a LAMTEC flame monitor can be connected, you have everything you need to control and monitor your burner in one device. Fail-safe and with the flexibility of adjustment that only used to be available from a PLC. This gives you the solution to nearly all your firing tasks. Safety interlock circuits, sensors and detectors are connected directly to the FMS. The need for supplementary relays and wiring is vastly reduced. Using the FMS often means that only a small local control cabinet is needed. An integrated device like the FMS also offers significant advantages during commissioning. Through minimisation of the wiring and the unified user interface, sources of error are minimised from the very beginning, while the search for faults is assisted through appropriate and relevant advice.

For the electronic compound, each positioning element can optionally be driven by either 0/4...20A or three-state-step signals.

The FMS also allows a large number of special requirements to be satisfied.

For example:

- Firing 2 fuel boilers with 2 burners and a joint blower and a common fuel flow tube.
- Pre-ventilation suppression when several burners are present in one combustion chamber.
- Fuel change from oil to gas and back on the fly by means of pilot burner if the changeover time must be minimised when changing the fuel.

Alternatively:

- Sliding fuel change: Change from oil to gas and back without loss of power, i.e. the boiler power remains fully available during the changeover process.
- Simultaneous combustion of 2 out of 3 fuels with variable mixture ratio.
- Continuous ignition flame operation
- Blow out of the burner lance

The compound curves that have been set can be shifted during operation by 2 disturbance feedforward correction inputs. This permits compensation for the factors such as variable inlet air temperature that affect the combustion.

Operating and error messages are displayed in plain text in the appropriate language. An additional NEMS indicator device for fault, operating signals and as well for adapt safety chain interlock circuits can be interfaced. An operating hours counter is integrated, and also counts the burner operating hours with each fuel. The start-ups for each operating mode are also separately counted.

If desired, the FMS can also perform output control of the firing rate.

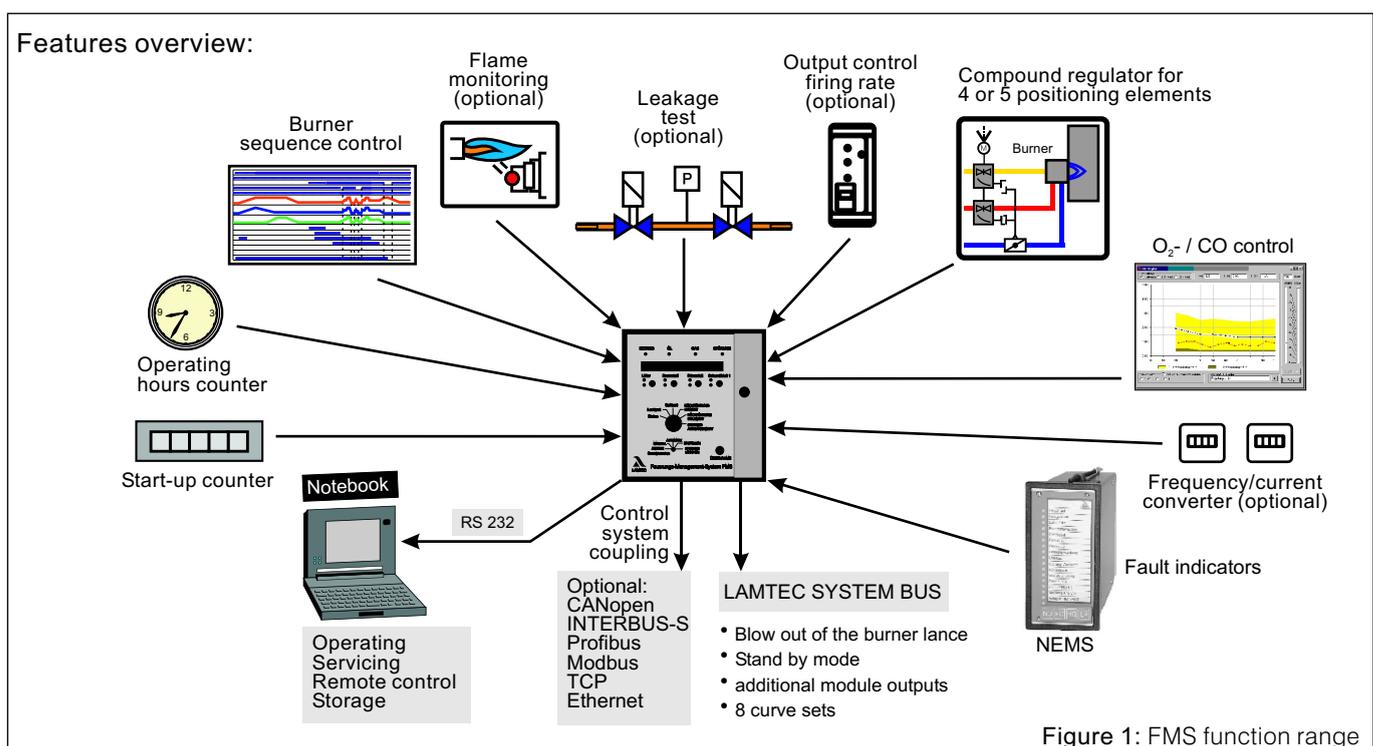


Figure 1: FMS function range

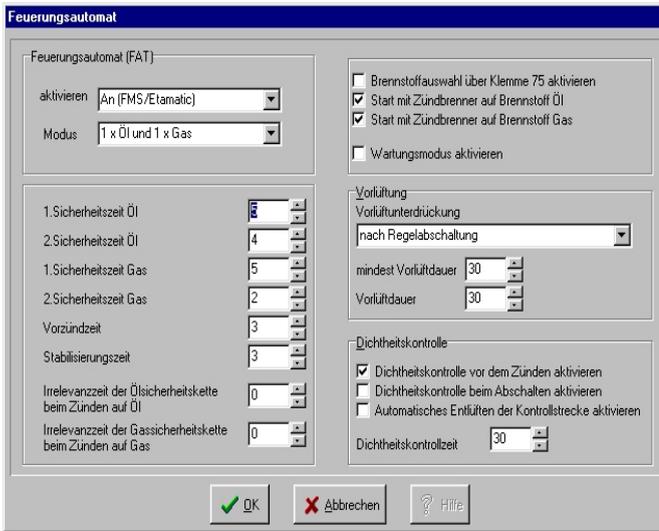


Figure 2: "Firing mechanism parameters"

The analog inputs of the FMS can be configured for a great variety of physical input magnitudes by means of plug-in cards. Many software functions, such as the pre-ventilation time, can be parameterised on site during commissioning.

A software module  $O_2$ -/CO control is integrated into the FMS. In combination with the  $O_2$ /CO-measurement devices LT1/LT2 via the LAMTEC SYSTEM BUS every firing installation can be maintained constantly at the ideal operating point, independently of environmental conditions such as temperature and air pressure.

The FMS can be effectively combined with existing control system. It "speaks" the language of almost every conventional fieldbus.

The FMS has been tested by TÜV, and satisfies both

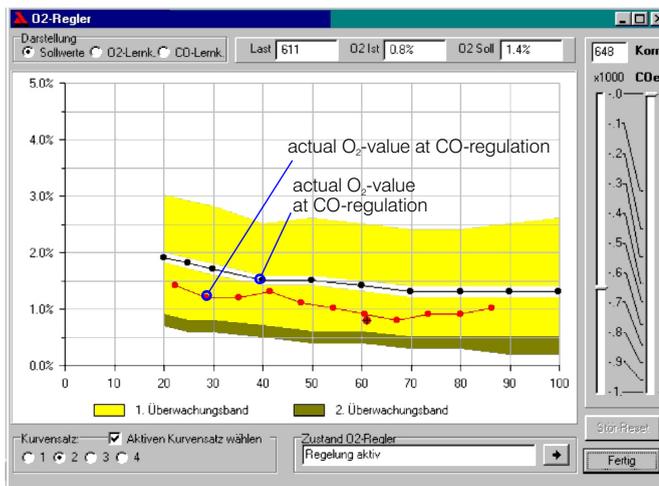


Figure 4: Visualisation of the  $O_2$  setpoint-curve with its monitoring-band-gaps and the actual  $O_2$  value on the CO-threshold when using the FMS integrated CO controller

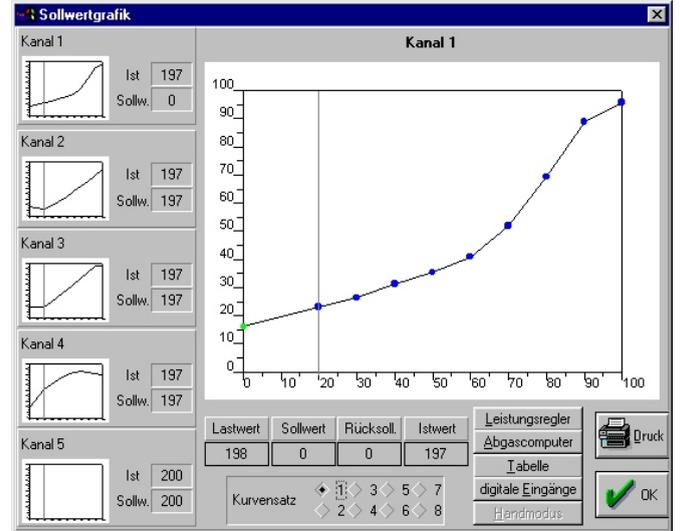


Figure 3: Visualisation of the compound curves through the remote control software

the relevant European Standards (EN).

An additional PC interface provides valuable assistance for the work of commissioning the FMS. A laptop can be used to control the device remotely, and both the set configuration and the curve data can be archived. If it should ever be necessary, a replacement unit can be prepared for operation within seconds: the stored data is simply read in.

The FMS can even be interrogated from your office if an industrial modem is used. If a malfunction should occur,



Figure 5: FMS with F250 flame monitor

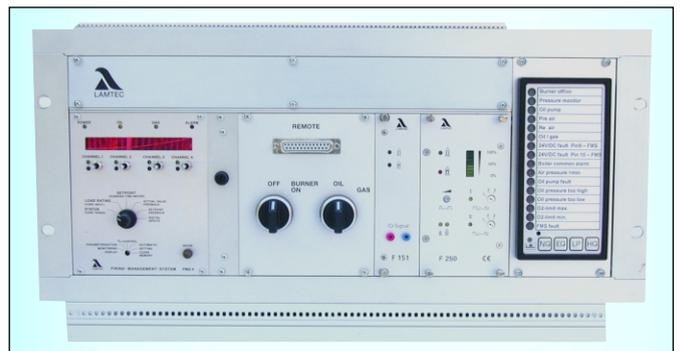


Figure 6: FMS in a 19" rack with operating switch, pilot and main flame monitors and fault indication unit

<p><b>Electrical power supply</b> optional:</p> <p><b>Power consumption</b></p> <p><b>Ambient temperature</b> Operation: Transport and storage</p> <p><b>Display</b></p> <p><b>Permiss. ambient humidity</b></p> <p><b>Inputs and outputs</b></p> <p><b>Digital signal inputs</b></p> <p><b>Load preset</b></p> <p><b>Analog inputs</b></p> <p><b>Positioning outputs</b></p>	<p>230 V + 10 % - 15 % 50/60 Hz 115 V + 10 % - 15 % 50/60 Hz <b>To be used only in a grounded power line network!</b></p> <p>approx. 34 VA</p> <p>+ 0 ° C...+ 60° C - 25 ° C...+ 60° C</p> <p>Alphanumeric display, 16 characters can display set value, load value, status, O<sub>2</sub> set value and O<sub>2</sub> actual value, actual feedback value, set feedback value, digital inputs, constant positioning output value, correction input or correction range and running text display</p> <p>Class F, DIN 40 040</p> <p>16 digital inputs 8 - 16 digital outputs 1 - 5 analog outputs 12 analog inputs All none at zero-voltage expandable via LAMTEC SYSTEM BUS modules</p> <p>16, via zero-potential contacts 24 V DC</p> <p>Selectable potentiometer 1 - 5 k Ω, (0/4...20mA) current signal or three-state-step positioning output Optional: Direct actuation PT 100 (if the load regulator is used)</p> <p>Selectable potentiometer 1 - 5 k Ω or 0/4...20 mA current signal. Optional: Direct actuation Namur transducer, direct PT 100 actuation</p> <p>4 or 5, optionally continuous or three-state-step (via external module), on the FMS 5 channel 5 is always continuous.</p>	<p><b>Resolution:</b> per analog input</p> <p><b>Three-state-step:</b></p> <p>Recommended run time of the positioning drive:</p> <p><b>Constant outputs:</b> Load:</p> <p><b>Correction inputs:</b></p> <p><b>Digital outputs:</b> via separate 660 R 0016 relay module</p> <p><b>Storage of the set values and variable data:</b></p> <p><b>Number of curve-sets:</b></p> <p><b>Number of programmings:</b></p> <p><b>Interface:</b></p> <p><b>BUS coupling:</b></p>	<p>999 digits, 10 bits</p> <p>via external relay modules type 660 R 0013 up to 50 mA (40 Nm) type 660 R 0131 &gt; 30 Nm up to 3,1A</p> <p>30 s...60 s</p> <p>0...10 V &gt; 5 k 0/4...20 mA &lt; 600</p> <p>2, adjustable to 0...20 mA or 4...20 mA Channel and action can be set by means of parameters.</p> <p>Main gas 1, main gas 2, oil valve, ignition valve, ignition transformer, fan, indication of oil or gas operation, oil pre-heating, ignition gas enable, pre-ventilation, final ventilation, fault</p> <p>in EEPROM, up to 20 points per curve with linear interpolation</p> <p>2 per channel (e.g. for oil/gas combined burner) optionally 4 or 8</p> <p>Unlimited (EEPROM)</p> <p>2 serial interfaces on 25-pole sub-D socket, only addressable with adapter, RS 232 (standard setting 19200 baud, no parity, 8 data bits, 1 stop bit) and LAMTEC SYSTEM BUS</p> <p>Via 25-pole sub-D socket, BUS card optional for these systems: Interbus-S (Phoenix) Profibus Modbus CAN-BUS Ethernet</p>
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**Dimensional drawings:**

