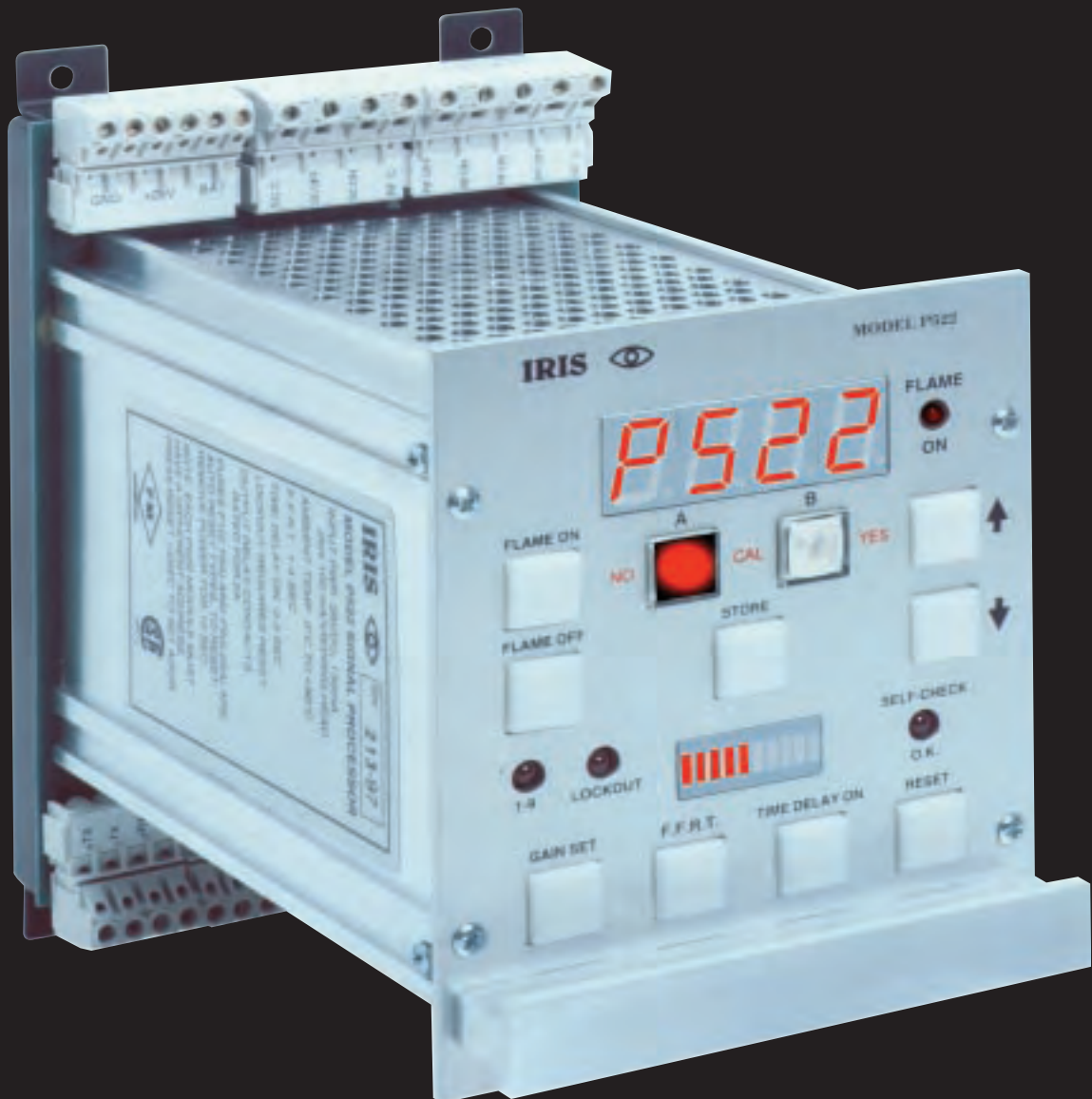# IRIS

FLAME MONITORING SYSTEM
MODEL P522 SIGNAL PROCESSOR

WORLD LEADER IN FLAME MONITORING

APPLICATIONS

DISCRIMINATES BETWEEN ALL TYPES OF BURNER FLAMES

- **POWER UTILITY BOILERS**
- **INDUSTRIAL POWER BOILERS**

DISCRIMINATES BETWEEN MAIN FLAME AND UNWANTED BACKGROUND

- **LIQUOR RECOVERY BOILERS**
- **GRATE FIRED BOILERS**
- **LIME KILNS**

IN THE PROCESS INDUSTRES

- **CLAUS REACTORS (H_2S)**
- **DUCT BURNERS**
- **HYDROGEN BURNERS**
- **CO BOILERS**
- **GAS TURBINES**

GENERAL DESCRIPTION

The IRIS Model P522 is a state of the art flame signal processor. It is designed to be used with the IRIS 500 series flame monitoring viewing heads.

The P522 microprocessor controlled device does the same thing as the Model 500 and P520 signal processor.

The P522 is a panel mounted unit complete with removable wiring terminals. There are 4 status LED's in the front, 1 digital readout, 1 10 segment bar graph and 11 push buttons for displaying and setting the processor.

HOW IT WORKS

The flame signal from the viewing heads is a pulsing signal. The number of pulses is proportional to the flame signal strength. These pulses are uniform in amplitude and width but random in time between pulses.

The pulsing nature of this signal eliminates the need for an analog to digital conversion in the signal processor. Also, the transmission of pulses makes all the flicker type detectors compatible with the UV type flame detectors, an inherent pulsing device, ie., the UV tube emits pulses when exposed to UV radiation. The pulsing signal from the viewing heads is fed directly to the embedded microprocessor which processes the data.

LOCAL OR REMOTE PROGRAMMING

It is possible, for example, to program the FLAME ON and FLAME OFF set-points locally (from the front panel) or remotely (from a host computer) using FlameTools 95/NT software. The P522 communicates with the remote computer through its RS-422 to RS-232 converter at either 4800 or 9600 baud selectable at the P522 processor front panel.

A and B SETTING

There are two complete sets of set-points, gain settings and time delays that can be programmed, either locally or remotely. These are called set A and B or channel A and channel B. Either channel can be selected at the output connector to choose different settings for different fuels. For example, when channel A is chosen, the illuminated push button A is lighted. When channel B is chosen, push button B is lighted.

EASY TO PROGRAM

It is very easy to program the set-points. To see the digital FLAME ON set-points, simply press the FLAME ON button. The current FLAME ON set-point number will immediately display. It will stay for about 3-4 seconds, then automatically switch back to the

normal flame monitor operating mode. When it is displayed, the setting can be changed by raising or lowering the number with the UP or DOWN arrow buttons. When the desired set-point number is reached, it can be stored by pressing the STORE button.

EEPROM MEMORY AND SOFTWARE

The memory used to store the settings is an EEPROM which will not lose its stored data when the power goes off. The EEPROM used allows 100,000 program changes. The settings also can be programmed from a remote computer. Software is available for this programming as well as for gathering data from each P522. For example, the computer can request from each P522 its current set-points, gain setting and time delay settings or its current flame signal reading.

PACKAGING

The P522 is a panel mount designed. It is designed for easy installation and removal. The processor can be replaced without any wiring changes. The terminals on the P522 are removable on the top and bottom.

is called SELF-CHECKING and the other FLAME RELAY. The SELF-CHECKING has one FORM C set of contacts. The FLAME RELAY output has two FORM C sets of contacts. When the SELF-CHECKING output is energized, the P522 is on and running O.K. The SELF-CHECKING LED on the front panel of the P522 will be turning on and off (blinking). The FLAME RELAY is energized when the P522 detects flame and the signal is above the FLAME ON set-point for a period set by the TIME DELAY ON set-point. The FLAME ON LED on the front panel of the P522 will be ON. What is unique is that the principal output (FLAME RELAY) is an integral part of this self-checking circuit. Any component failure or program failure in the P522 will cause both these outputs to de-energize or fail safe.

P522 POWER

The P522 module requires an external power supply. It should have an output of 26VDC (24VDC when not using battery backup) at 200mA (300mA if used with the model S550 viewing) with an additional 100mA for each viewing head used. The power goes first to the P522, then through a self reseting fuse to feed the viewing head(s).
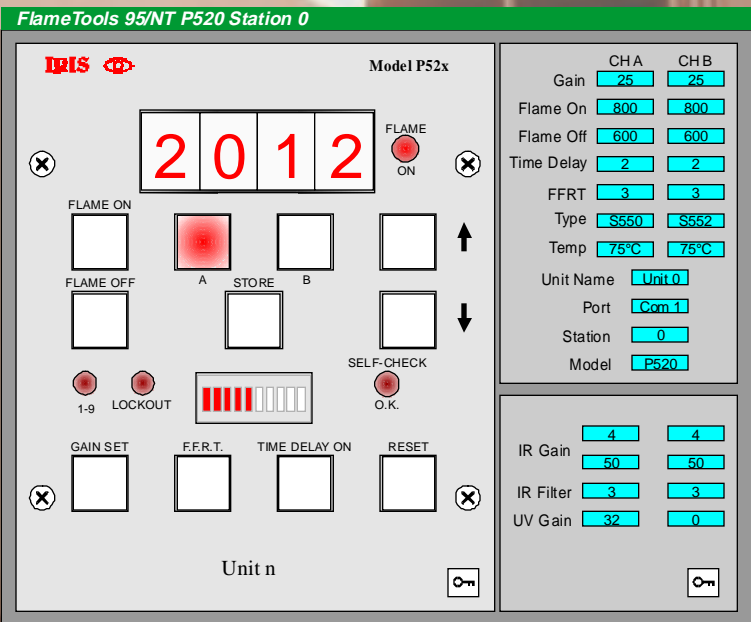
SELF CHECKING FEATURE

A unique self-checking circuit monitors the P522 program. This can best be described as a "dual mode watch dog timer." There are two principal outputs from this circuit which are implemented using relays. One output

SPECIFICATIONS

ELECTRICAL
Input Power
- 26 VDC +5% - 20%, 300mA with one viewing head
- (24 VDC when not using battery backup)
  (100mA for each additional V.H.)

ENVIRONMENTAL
Ambient Tempertaure
- 0°C to + 50°C

CABLE (Between Viewing Head and Signal Processor)
- 4 Conductor, # 18AWG, one wire shielded
  with braided shield for flame signal.

OUTPUTS
Flame Relay
- 2 Form C Contacts

Self-Checking Relay
- 1 Form C Contact
  Contact Ratings:
  Max switching power 60W, 100VA
  Max switching voltage 220V AC, DC
  Max switching current 2A

Analog Flame Signal
- 0-20 or 4-20 mA current output for remote meters, 360Ω max resistance.

Power to Viewing Head
- +26 VDC, Self Reseting fused, 0.25A
- +14.3 VDC Pulsing 0.2 Sec "ON" 0.8 Sec "OFF"

INPUTS
Channel Select
(Isolated Input*)
- V_{IN} 7.5-30 VDC range (Input R=3900Ω)
  26 VDC, 6.4mA
  10 VDC, 2.3mA

Flame Signal from V.H.
- V_{IN} 7.5-30 VDC range (Input R=3900Ω)
  13.6 VDC, 3.2mA

Serial Communication
RS-422 (Differential)
4800 or 9600 Baud
- Input/Output circuits photocoupler isolated from P522 power supplies and ground
- Baud rate selectable from front panel of P522

* Requires two wires

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