



RB7000 Safety Monitor

PLC SYSTEM MONITOR FOR THE MOST DEMANDING SAFETY APPLICATIONS

- **Sequence Control for burners, compressors and turbines.**
- **Emergency Shutdown and Fire & Gas Systems**
- **Processing for food, chemical, pharmaceuticals etc**
- **Traffic light sequencing, railway signalling etc**
- **Water Treatment**
- **Light Guards**

SAFER PLC OPERATION

The RB7000 is a Control Systems Safety Monitor developed by British Gas (Midands Research Station) initially to meet Health and Safety Executive PES guidelines which state that “no single failure due to hardware or software of a Programmable Electronic System (PES) should cause a hazardous situation”.

Although the HSE guidelines refer to PES's, they are equally applicable to relays and other solid state control systems.

APPLYING THE RB7000 SaM

Each SaM module consists of 8 channels which can readily be linked to a further 7 modules offering the ability to monitor up to 64 critical I/O points.

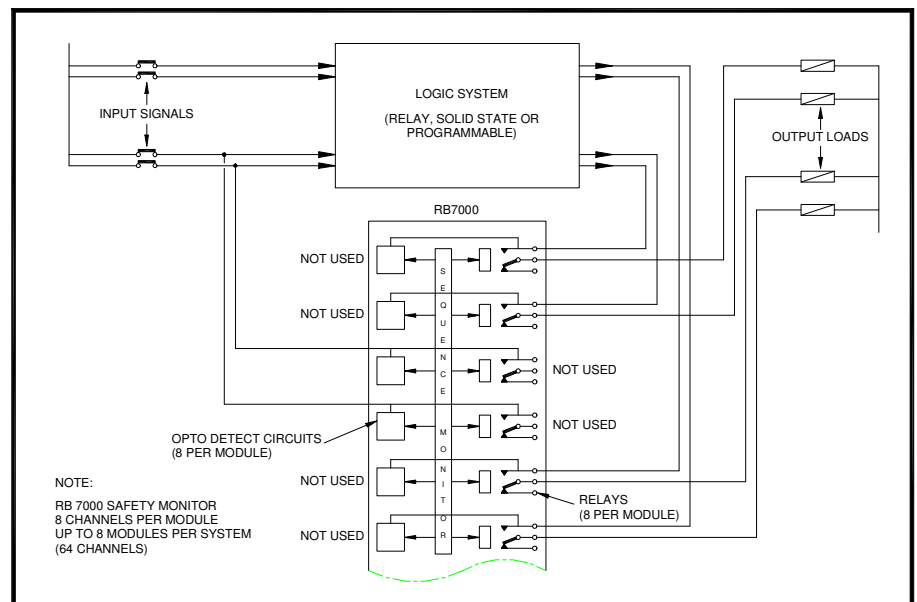
Within the SaM is an Erasable Programmable Read Only Memory (EPROM). A truth table of allowed and disallowed control actions is generated and entered into the device. The I/O states wired through the SaM are then compared continuously with the required state and shutdown action is initiated if a discrepancy occurs.

A watchdog timer (10 sec. max) within the SaM can be used to guard against system lock up in a critical sequence step.

It is important to emphasise that only critical I/O need be monitored (ie those controlling safety functions) and that the SaM only takes action if a potentially hazardous situation arises due to a failure of the primary system.

FUNCTIONS

- Monitors the operation of primary controller and ensures the system is running safely
- Monitors up to 64 critical I/O points
- Diverse hardware/software back up in accordance with the HSE's PES guidelines
- Fail safe
- Uses only discrete hardware (no microprocessor)

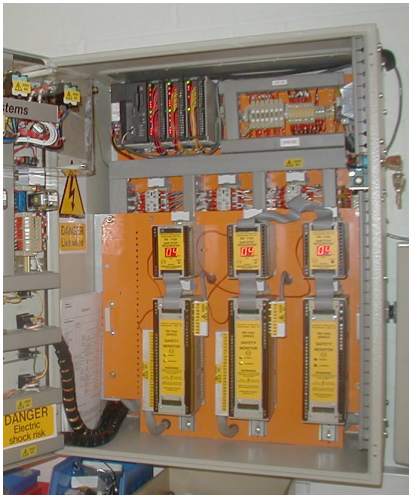


RB7000

MODULE OPTIONS

MASTER OR SLAVE

In every configuration the first module must be the Master. This module incorporates the EPROM in which the required truth table is held. Subsequent modules added to the System must be slaves, which receive their operational instructions from the Master EPROM SaM.



RB7000 SAFETY MONITOR

All modules contain 8 channels. Each channel comprises a connected input and an output. Inputs are compared with the SaM's sequence table and if correct, the outputs will assume the status of their respective inputs. If incorrect, then the outputs assume a safe state.

INPUT VOLTAGE

All 8 inputs on a module will have the same input voltage detection range. Master and Slave modules are available to cover a number of different input voltage ranges.

FAIL SAFE DESIGN

The RB7000 SaM has been designed to be fail safe. The main features incorporated to achieve this are:

- 1 A parity checking circuit incorporated in the design, which helps to ensure the integrity of the data stored in the EPROM.
- 2 SaM's relays are driven by diode pump circuits. If one of these fails, the associated relay will be de-energised.
- 3 A voltage detection circuit to initiate a shutdown if the supply voltage falls below a preset level - typically 85% of operating voltage.

Note: A failure of the above checking circuits will also cause the SaM to reset to the safe state.

Cyfas's policy is one of continuous product improvement and the right is reserved to modify specifications contained herein without notice.

TECHNICAL SPECIFICATION

Supply options:

24VDC, 18VA nominal
(18VDC – 30VDC)
110VAC, 18VA nominal
(95VAC – 120VAC)
240VAC, 18VA nominal
(205VAC – 265VAC)

Input Voltage Options:

12VDC – 48VDC, <5mA
24VDC – 110VDC, <5mA
110VAC – 240VAC, <5mA
No of channels: 8
Temperature rating: 0°C to 50°C

Output contact rating

24V AC or DC, 3A max
110VAC, 3A max
240VAC, 3A max
Rated breaking capacity: 250VA
No of channels: 8
Temperature rating: 0°C to 50°C

PACKAGING

All modules housed in Polycarbonate UL94-VI rated housing DIN rail mounting.
Dimensions: 225mm high x 75mm wide x 110mm deep

CONFIGURATION

Number of channels per module: 8
Max number of modules per chain: 8 (1 Master and 7 Slaves)
Max no of sequence steps: 126 (1 table) or 2 x 63 (2 tables)

ORDERING INFORMATION

Model RB 7.....!.....!.....!

Supply _____
1 – 24VDC
4 – 110VAC
5 – 240VAC

I/O type _____
02 – 12-48V Input/Relay Output
04 – 24-110V Input/Relay Output
06 – 110-240V Input/Relay Output

Module Type _____
M – Master
S – Slave

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