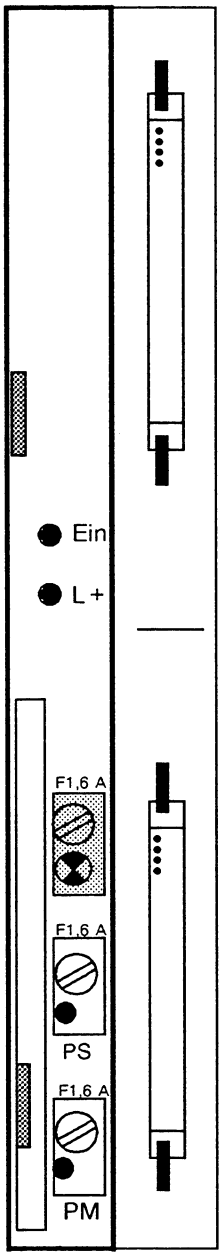
SIEMENS

TELEPERM M

I/O Comparator and Switchover Module (EAVU)

6DS1 144-8AA

Technical Description C79000-T8076-C343-02



1 Application

The I/O comparator and switchover module (EAVU) is used in the fault-tolerant AS 235 H automation system.
It forms the link between the central unit (which consists of two central processing units in an AS 235 H system) and the I/O modules.

The EAVU

- converts redundant I/O bus signals from the central units into single-channel I/O bus signals of the extension unit (EE);
- distributes single-channel signals to the two CPUs;
- routes signals from the master CPU to the individual modules;
- verifies the identity of redundant address, data and control signals from and to the central processing units;
- generates an error signal if it detects a discrepancy;
- determines the range concerned by a given I/O command;
- provides information regarding
  - jumper setting
  - last I/O access
  - last register access
  - comparator and status information

  via internal registers;
- influences
  - the actual mastership
  - check of the local extension unit
  - clearing the error registers
  - interrupt inhibit

  via internal registers;
- provides fault finding utilities
- monitors process alarms
- monitors that the supply voltages (24 V and 5 V) are within the tolerance limits
- generates alarm and signal voltages for the local extension unit range (both voltage circuits are provided with a 1.6-A fuse).

One EAVU can be installed in each extension unit. Up to seven EAVU modules are therefore possible in a fully configured AS 235 H system that consists of basic and extension cabinets (cf. Chapter 2.1 of the Operating Instructions; Order No. C79000-B8076-C293). 91 I/O modules may be addressed in normal configuration, including up to three group interrupt modules (SF61) in the basic cabinet.

The EAVU module is installed in the slot at the extreme right-hand side (seen from the front) of a 14-slot extension unit (addresses 0 to 13).

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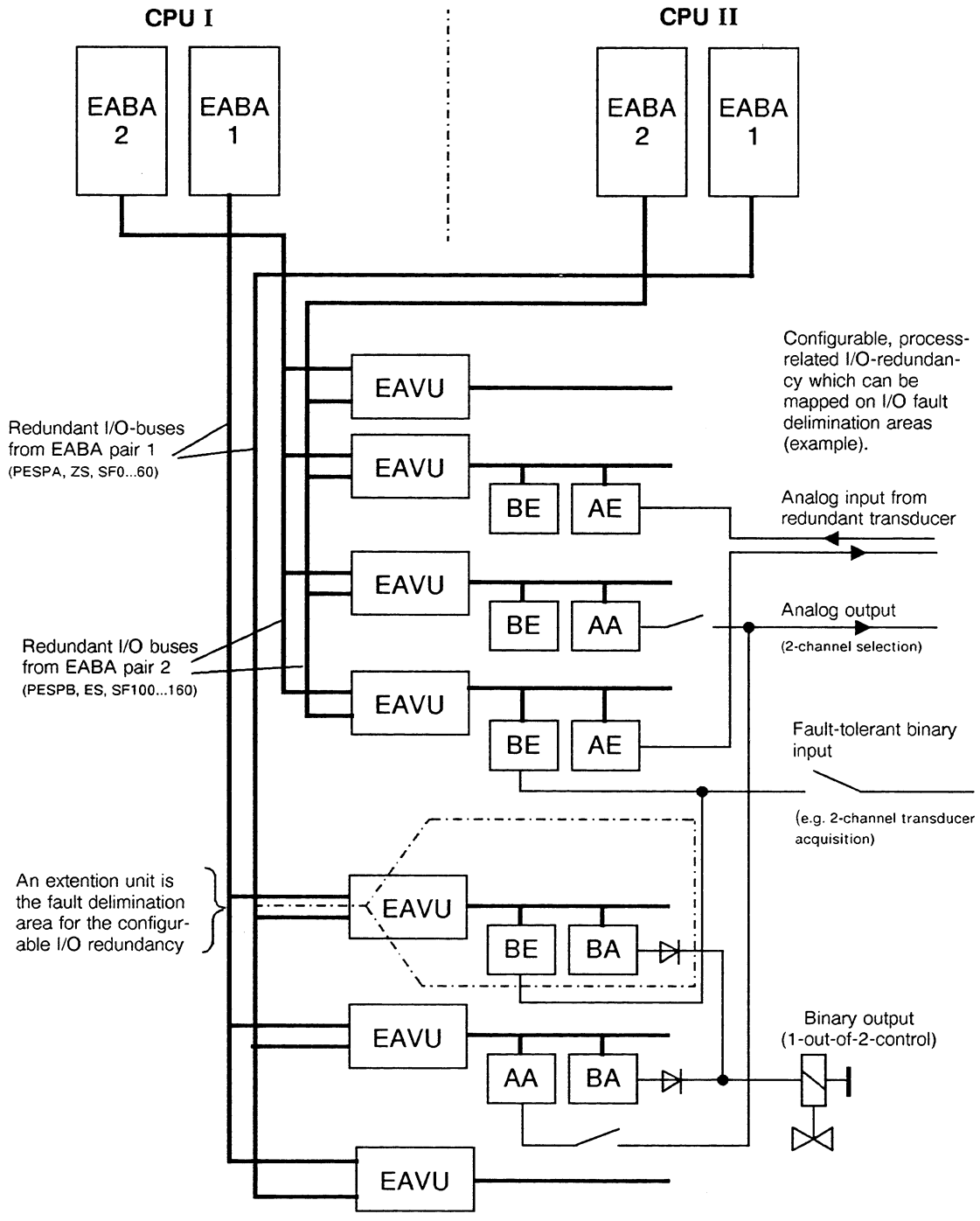


Fig. 1.1 The EAVU in the process I/O structure of an AS 235 H (example)

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2 Design

The EAVU module consists of a basic and an extension board, which are screwed together.Two front-panel connectors (for ribbon cables) on the extension board provide the connections between the EAVU module and the two redundant I/O buses.

Two backplane connectors provide the connections to the extension unit I/O bus (X1) and the 24-V supply voltage (X2).

Rack-related jumper settings are also performed in the X2 backplane connector.

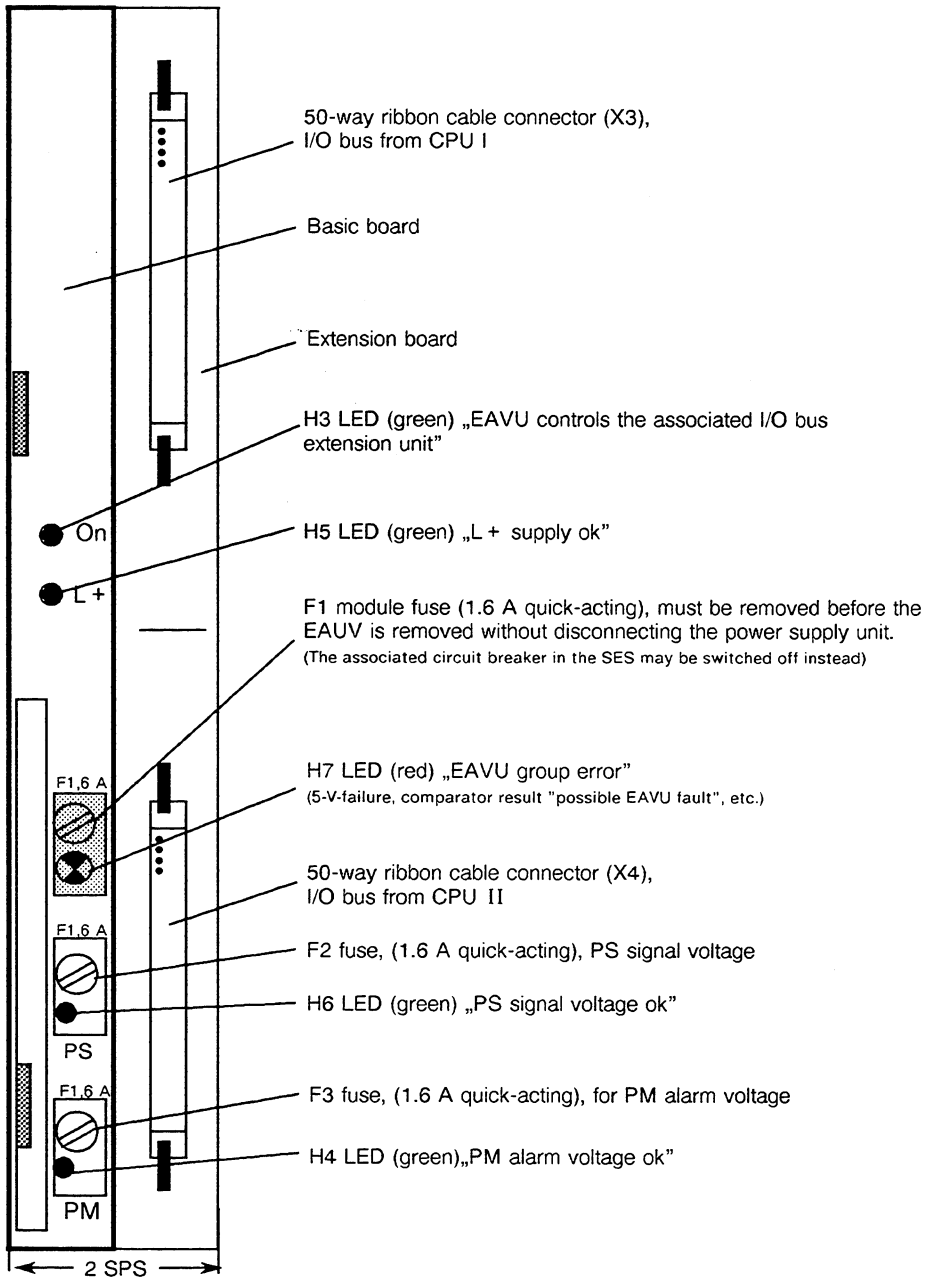


Fig. 2.1 EAVU front panel

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3 Method of Operation

3.1 Function

The EAVU maintains a direct connection with the two central processing units via the two ribbon cables that are connected to the front-panel connectors. Data and signal exchange with CPU I takes place via the upper connector (X3), the lower connector (X4) is used for data and signal exchange with CPU II.
The extension units in the basic cabinet (EABA1) and the extension cabinet (EABA2) are connected via one pair of I/O bus interface modules each.

In normal operation, the EAVU is supplied via this connection with two synchronous sets of data and signals. It checks whether the two sets are identical, determines the addressee (e.g. I/O module y) and transfers data and signals from the master CPU to the single-channel bus of the extension unit.

Signals and data from the I/O modules are transferred to the EAVU, and branched to the two central processing unit connections.

The EAVU sends a fault signal to each CPU if it detects a discrepancy between CPU I and CPU II. It also checks the signals on the single-channel I/O bus (by feedback reading).

Signal processing and utilization of the internal registers is discussed in the following chapters.

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LED „fault" (red, blinking)

This blinking LED, which can be synchronized with the cabinet clock pulse (BS), is triggered if

- the 5-V bus supply voltage is out of tolerance
- the L + supply voltage is out of tolerance
- the module fuse has been removed
- the hardware interpretation of an access status indicates an EAVU fault in the single-channel part
- the common fault bit has been set.

The last possibility is used by the system software for indicating a fault on an EAVU or a related extension unit. The fault LED does not indicate if both L + and PM fail (e.g. after the circuit breaker in the SES has tripped or both front panel fuses have blown). The two green LEDs "L + " and "PM" are off in these cases. The blinking clock pulse in the cabinet has failed if, in these cases, the red fault LED lights permanently.

Provided that L + and PM are within their tolerances, a fault indication (including the ones set by the software) issues a static and a dynamic 24-V signal (FMS and FMD) which may be included in the hardware alarm concept (cabinet lamp, control room).

LED (green) and module fuse (F 1.6 A) „L + "

The module fuse protects the **L +** supply voltage of the EAVU. Removing the fuse resets the EAVU and enables the EAVU to be separated from the EE and CPU buses in a controlled manner.



Caution:

If L + has not been switched off at the SES circuit breaker, the module fuse must be removed before the EAVU can be removed or the front panel cables can be disconnected or connected. The fuse may only be re-inserted after the module has been installed.

The green LED is fed by the EAVU L + supply after the module fuse. The module fuse has blown or the L + supply voltage of the EE failed if this LED is extinguished.

LED (green) and fuse (F 1.6 A) „PS"

The EAVU supplies the 24-V signal voltage via this fuse and an X2 pin (b28) to certain I/O modules. This voltage also feeds the green LED. The signal voltage for the extension unit has failed if this LED is extinguished. This means in general that the PS fuse on the EAVU module or the extension unit L + supply from the SES has failed.

LED (green) and fuse (F 1.6 A) „PM":

The EAVU supplies the 24-V alarm voltage via this fuse and an EE bus line to the I/O modules. This voltage also feeds the green LED. The alarm voltage for the extension unit has failed if this LED is extinguished. This means that the PM fuse on the EAVU module or the extension unit L + supply from the SES has failed.

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4 Installation and Commissioning

4.1 EAVU Connection

The EAVU module is installed in slot no. 14 of the extension unit (the slot at the extreme right-hand side, seen from the front).

The upper backplane connector X1 connects to the power supply module of the extension unit and, via the bus board of the extension unit, to the I/O modules in the extension unit (5-V bus, EE-I/O bus).

The lower backplane connector X2 connects to the cabinet power supply unit (24-V supply used for generating 24-V signals). The necessary jumpering must also be made at this connector (see Chapter 4.4).

The ribbon cable from CPU I (cable duct) is plugged into the upper front connector X3; the ribbon cable from CPU II is plugged into the lower front connector X4.

The topmost fuse in the front panel protects the module power supply, the two other fuses protect the PS signal voltage (centre) and the PM alarm voltage (bottom).



Caution

The module fuse may not be installed before the module has been inserted, and must be removed when the module is removed without the module power supply being switched off.

Four of the five LEDs on the front panel are on during faultless operation. The fifth LED (below the module fuse) lights up in the event of a failure.

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5 Technical Data

Operating voltage	L+	+24 V range:	19 to 33.5 V, 100 mA load (+PM and PS load)
Signal voltage	PS	+24 V output:	derived from L+ *)
Alarm voltage	PM	+24 V output:	derived from L+ *)
Operating voltage	5-V-Bus	+5 V range:	4.5 to 5.5 V, 300 mA load
Blinking voltage	BS	+24 V range:	20 to 33 V, 0.01 mA load
Reference potential	M1	0 V, (for 24 V)	
Reference potential	0 V	0 V, (for 5 V)	

Module fuse	F1	1.6 A, quick-acting
PS fuse	F2	1.6 A, quick-acting
PM fuse	F3	1.6 A, quick-acting

Storage temperature	-40°C to 70°C
Operating temperature (cabinet)	0°C to 40°C

*) The EAVU consumes up to 100 mA from the backplane PM if this voltage is fed redundantly and the module and PM fuses have blown. The EAVU consumes up to 10 mA from PS if this voltage is fed redundantly and the PS fuse has blown.

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