

Prepared (also subject responsible if other)		No.		
ÄL/UAB/G/XL R-M Friberg +46 8 727 3295		UAB/G/X-02:026Uen		
Approved	Checked	Date	Rev	Reference
G/XL (Kristina Einarsson)		2002-01-31	B	

Fan supervision in AXE 810

1. Background

GEM – Generic Ericsson Magazine concept is introduced in AXE 810. The GEM contains two duplicate 16KMUP GS units plus a pair of maintenance regional processors. The GEM also provides physical space for up to 22 different device boards, as ET155-1, TRAR6, ECP5.

A TRA or ECP board can use up to 18W depending of logarithms used. This means that the heat dissipation from a GEM magazine can be up to 500W. A cabinet equipped with up to four GEM magazines require a minimum of 2 fan units. One extra fan unit is added for redundancy reasons and to support easy replacement of a faulty fan. In total three fan units is used per GEM cabinet and in cabinets mixed with GDM magazines up to four fan units exist.

As a consequence of this, we need to have a better detection on which fan unit contains a fault when an alarm is issued. Therefore is an improved fan supervision introduced in AXE 810.

2. New fan control

The new fan units currently used both for GDM and GEM magazines in AXE 810 can be maintained in two different modes.

Simple control.

All supervision is made internally within the fan unit. When a fault situation occurs a MIA LED will light on the front panel of the fan unit and an external alarm outlet will signal (galvanic Make/Break).

Active control

All supervision information is send from the fan unit on a V.24 interface to an 'intelligent' O&M handler. This handler can generate more detailed alarm information based on the received information. For example can a partial fault when only one of the three fans in the fan unit is faulty, be distinguished from a complete outage of a fan unit. The O&M handler operates the MIA LED as a way to guide the operator in a repair procedure. The Hardware Inventory Information of the fan can also be read via this interface.

This interface supports that up to 8 fan units are connected to one O&M handler in a daisy chain configuration. By this is meant that one O&M handler can connect to several fans by using one serial connection.

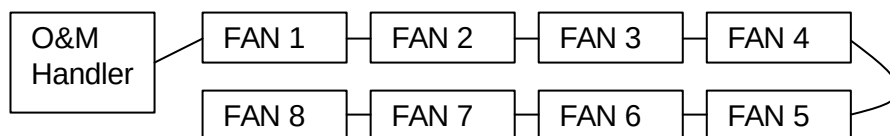


fig.1 Up to 8 fans can be handle by one O&M handler

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3. AXE 810 realization

In AXE 810 is the GEM concept introduced. The O&M handler is realized on the SCB-RP board in GEM through the Regional Processor (RP) software. Through this O&M handler we can have an active control of the fans.

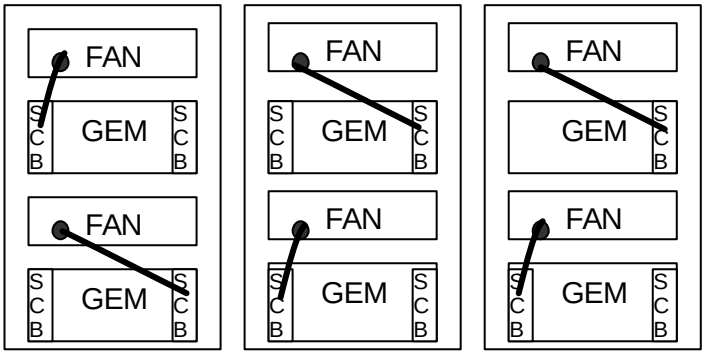


fig 2: Fan units supervised by SCB-RP board in the GEM magazine.

The fan unit is connected to the SCB-RP board with a V.24 cable and is using a proprietary protocol to communicate. See fig 2. The O&M handler realized in the Regional Processor (RP) Software can via this communication retrieve lots of status and alarm information as well as reading the Hardware Inventory information and controlling the MIA LED. For Hardware Inventory data see further in ref. 3.

Any SCB-RP board can communicate with up to 8 fan units. The supervision of the fan units is a 'Plug & Play' function where the fan units automatically assign themselves unique units number, 1 to 8, starting from the first one connected to the SCB-RP board. The O&M handler in the SCB-RP can address each fan unit individually as long as the communication chain is intact.

Both fan units used for GDM and GEM magazines can be supervised in the same chain starting from SCB-RP board and controlled by the Regional Processor (RP) software. See fig 3.

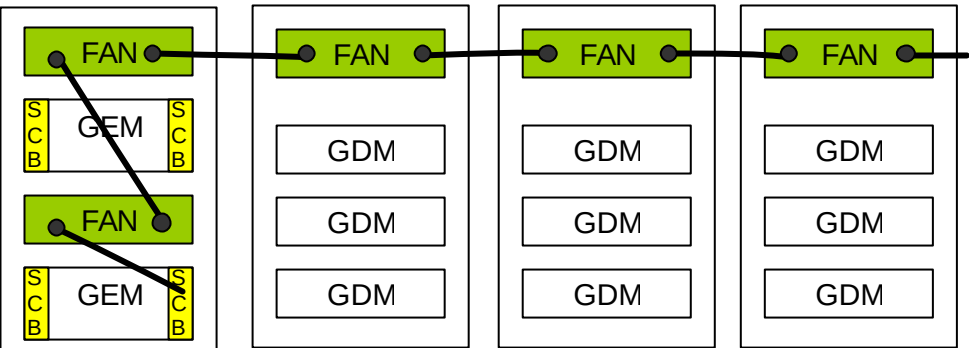


fig 3: Fan supervision of GEM and GDM fans in the same chain

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4. Configuration guidelines

If the communication chain between two fans is broken due to for example a faulty fan or cable, all fans connected after in the chain is no longer supervised in an active control. Also if the controller Regional Processor (RP) on the SCB-RP board is blocked the supervision is not performed.

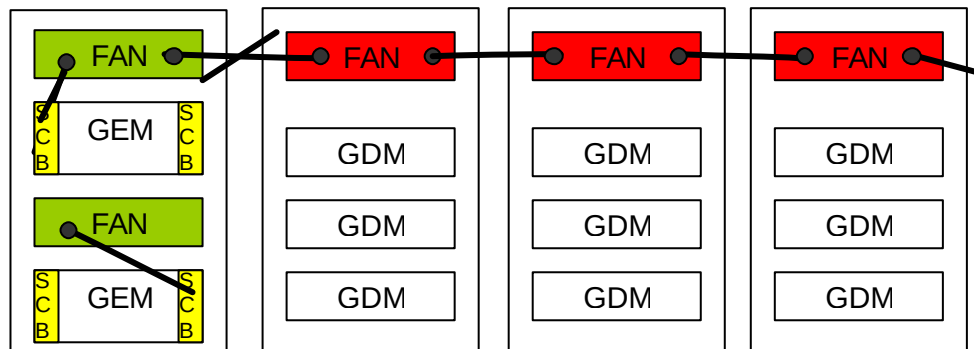


fig 4 Connection lost between two fan units, fans connected after in the chain has no active control

- For this reason as few fans as possible should be connected in each chain.
- The GEM fans must also be the first in the supervision chain connected directly to the SCB-RP board.
- It is also recommended to have only one GEM fan in each chain.

5. Function description

After every system restart or after deblocking of a fan port controller Regional Processor (RP), the fan port is continuously scanned and data for every possible fan unit are stored in the regional processor and in the central processor. These data are updated for every possible modification. The data stored in the central processor are needed to output the proper alarm printouts when a fault or a fan unit disconnection is detected.

The fan unit data contain the controller Regional Processor (RP) number, the fan unit number and the fault indication. This information is provided to the operator via the alarm printouts to localize the fan unit. Thus, the operator can repair the proper unit in case of an alarm.

If the controller Regional Processor (RP) is blocked, the fan port supervision will not be performed.

The supervision is performed continuously after restart or deblocking of the Regional Processor (RP) and in case of a fan alarm data change, the fan unit information is updated.

A fan fault alarm is given if a fault exists. Usually the repair action performed by the operator is to replace the fan unit with a new fan magazine.

The fault alarm is ceased when the continuous supervision of the fan port has shown, that the fault has disappeared.

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In case of Regional Processor (RP) blocking, an already issued fault alarm is ceased and re-initiated again with the information, that the Regional Processor is blocked.

If a fan unit is disconnected from the connection chain, the supervision of the port detects the absence and a fan disconnection alarm is printed. The disconnection alarm contains the Regional Processor and the disconnected fan unit number.

The disconnection alarm informs the operator for the fan unit absence, which can result to an increase of the temperature level on the cabinet.
The fault alarm is output for one fan unit whereas the disconnection alarm is output with all the disconnected fan units for a specific Regional Processor RP.

The function includes printouts for the following:

- **FAN MAGAZINE DISCONNECTED**
Alarm printout for fan unit(s) disconnection
- **FAN MAGAZINE FAULT**
Alarm printout when a fan unit is detected as faulty

6. Limitations

A maximum of 128 RP's can be used as fan unit port controllers.
The RP can control a maximum of 8 fan units connected in a chain structure.

7. References

Ref. 1 1/15517 – CNT 298 0020Uen FAN MAINTENANCE

Ref. 2 1551 – BFD 509 08Uen FAN SUBRACK

Ref. 3 UAB/B/X – 99:168Uen AXE HARDWARE INVENTORY