

Prepared (also subject responsible if other) EAB/UZ/DL Lars Dahlman		No 1551-CNZ 212 336 Uen	
Approved EAB/UZ/DL (Kjell Isacson)	Checked	Date 2005-09-22	Rev F
		Reference	

SUPPORT AND CONNECTION BOARD HARDWARE,
SCBHW

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1 REVISION INFORMATION

Revision B; The FW load modules have been included in this description.

Revision C; Never released.

Revision D; ROJ 208 323/2, with Ethernet switch, is added. ROJ 208 323/1 is no longer equipped with an Ethernet switch.

Revision E; ROJ 208 323/3, with Ethernet switch and 4 RPB-S ports, is added.

Revision F; RPB-E is added.

2 GENERAL

SCBHW (Support and Connection Board Hard Ware) supplies the AXE with a HW maintenance platform and communication channels on RPB-S and for two of the HW units also on Ethernet. The HW units are designed for use in GEM and equivalent subracks in BYB 501. FW for boot and restart at power up and default OS for deblocking are stored in flash memory. FW for switch configuration is stored in EEPROM (not on ROJ 208 323/1). All FW are loaded from factory. Loading of new SW is possible remote, except for switch configuration in EEPROM.

3 IMPLEMENTATION

3.1 Block Structure

The block SCBHW consist of three hardware units, ROJ 208 323/1 SCB-RP, ROJ 208 323/2 SCB-RP and ROJ 208 323/3 SCB-RP and four firmware units, CXC 106 0046 PBOOT_RPI_860, CXC 106 0044 RPI_CORE, CXC 106 003 RPI_CORE and CXC 106 0073 SWITCHCONF. The ROJ 208 323/2 and ROJ 208 323/3 hardware units are implemented as an PIU, consisting of a mother and a daughter board permanently mounted together. The ROJ 208 323/1 hardware unit is from R2G on implemented as an PIU, consisting of only a mother board. This means that in ROJ 208 323/1 the Ethernet switch functionality is missing (or not fully functional in the earlier revisions).

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4 INTERWORK

4.1 External Interwork

4.1.1 RPB-S Repeater part

In ROJ 208 323/1 and ROJ 208 323/2 the repeater part in SCB-RP distributes one path of an RPB-S branch from one preceding subrack or RPH through the repeater to the next subrack in a chain of subracks. The boards have two front connectors, RPB-S/I for incoming bus and RPB-S/O for outgoing bus as seen from the RPH. ROJ 208 323/3 is designed to be a single board that is cable connected to a path on an RPB-S branch. The RPB-S/O port is therefore missing. Instead the ROJ 208 323/3 has four front connectors for incoming RPB-S bus branches, RPB-S1 to RPB-S4, for distribution to the backplane.

The repeater part also supply RP-boards in the same subrack with RPB-S connections through the backplane, RPB-S/M. ROJ 208 323/1 and ROJ 208 323/2 support connections to the whole backplane from a path on one RPB-S branch. ROJ 208 323/3 support from one up to four branches of RPB-S connections to the backplane.

4.1.2 RPB-S interface to RP part

The RP part in SCB-RP uses a redundant RPB-S/M interface, path A and B, through the backplane. The RP also uses physical RP addresses, (subrack and slot address), from the backplane.

4.1.3 Ethernet switch part (on ROJ 208 323/2 and ROJ 208 323/3)

The Ethernet switch provides 26 100BaseTx interfaces through the backplane to boards in the same subrack. The switch also provides one 1000BaseT and two 100BaseTx interfaces on the frontpanel. One of these 100BaseTx on the front panel is only for test purposes and is equipped with a standard RJ45 connector.

4.1.4 Ethernet and RPB-E interface for RP part

The RP part of SCB-RP has two standard (IEEE802.3/Ethernet CSMA/CD) 10BaseT half duplex interfaces to the backplane. Each port has its own individual MAC address. ROJ 208 323/3 with revision R3 and higher has also a capability to connect the RP to the CP through RPB-E.

4.1.5 M-Bus Master part

SCB-RP can act as a master on the M-bus and is capable to supply up to 24 boards with M-bus slaves in the same subrack with a connection through the backplane.

4.1.6 M-Bus Slave part

As in other boards in BYB501, the SCB-RP also implements a slave on the M-bus, connected through the backplane.

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4.1.7 V.24

SCB-RP provides an V.24 interface accessible via a front connector. This can for example be used for fan supervision via the DENIB protocol.

4.1.8 JTAG

SCB-RP provides an JTAG interface accessible via the backplane connector. This is used for testing and loading of FW during manufacturing.

4.1.9 External alarm

SCB-RP provides an External alarm interface accessible via a front connector.

4.1.10 TS-HOD 500 Distribution module

The distribution module in SCB-RP uses two -48 V power supply, each capable to distribute up to 500W, through a frontpanel connector. The interface is of type TS-HOD Interface b.

The distribution module then supplies all boards in the same subrack with a filtered -48 V power connection through the backplane. This is an interface of type TS-HOD Interface a.

SCB-RP is capable of supervise four power buses in the backplane, partly the two power buses it distributes itself and partly two redundant power buses from another SCB-RP.

4.1.11 TS-HOD 500 Internal part

The SCB-RP uses a redundant -48 V power supply from the backplane for internal use. This interface is of type TS-HOD Interface a.

4.1.12 BYB 501

SCB-RP has been implemented in full height (265 mm), 225 mm depth and 30 mm width, in equipment practice BYB 501 with fan cooling.

5 FUNCTION

5.1 Start/Restart

The RP will autonomously start and boot at power up.

Program loading and deblock are ordered from the CP on either RPB-S or RPB-E (for those boards that can handle RPB-E). Once started on one bus type it will then continue on that one and can not use the other bus type without a restart.

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NOTE: Every magazine, that can house a RPB-E capable RP on the same slot as one RP connected with RPB-E, must have a unique Physical Magazine Address even if the intention is to use RPB-S for that RP!

5.2 Block Function

5.2.1 RP part

The processing function in SCB-RP is designed for execution of RP programs written in the C language.

5.2.2 RPB-S Repeater part

In ROJ 208 323/1 and ROJ 208 323/2 the RPB-S repeater function distributes one path on one RPB-S bus branch to all RPs in the same subrack and through an expansion port also to another subrack.

In ROJ 208 323/3 the RPB-S repeater function distributes one path of one up to four RPB-S bus branches to the RPs in the same subrack. Both SCB-RP boards in a subrack senses its position in the backplane to be able to automatically configure their RPB-S front ports to the same group of RPs. If four branches is used in the GEM each branch will handle about one quarter of the slots in the subrack. RPB-S1 will handle slot 0–5, RPB-S2 will handle slot 7–12, RPB-S3 will handle slot 14–19 and RPB-S4 will handle slot 20–25. Observe that slot 6 and 13 can not be used! The SCB-RP senses if it has an RPH connected in the other end of a bus cable. If a front port is not connected (and have not been earlier) the corresponding slots are automatically configured to the front port with nearest lower number that is (or have been) connected. This means for example that with only RPB-S1 connected, this bus branch will handle all slots in the subrack. In this special case the SCB-RP ROJ 208 323/3 will also handle slot 6 and 13, just like ROJ 208 323/1 and ROJ 208 323/2. Observe that it is not possible to change a configuration by just remove one RPB-S cable. The SCB-RP will remember that this cable has been connected and keep the corresponding configuration. The only way to reset the configurations is to remove all RPB-S cables and then reconnect cables only to the desired ports. When a failure occur or during an installation or repair the configuration can be different for the two paths. Because the RPs in the subrack only uses a part of their full logical RP address, this might lead to an addressing conflict on RPB-S. Therefor the logical RP addresses must be chosen so that the lowest four Bytes are different for all RPs in the whole subrack. The easiest way to do this is to let this part of the address be equal to the slot address.

To get a redundant RPB-S connection in a subrack two SCB-RP are needed, one for each path on the RPB-S branches.

5.2.3 Ethernet switch HW part (on ROJ 208 323/2 and ROJ 208 323/3)

The Ethernet switch can run in either unmanaged or managed mode, controlled by the RP part.

The switch runs in the store and forward mode which means that it can transfer packets between ports which have different speed and duplex modes.

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Autonegotiation of speed and Half/full duplex is supported on all ports.

5.2.4 Ethernet switch configuration FW part (on ROJ 208 323/2 and ROJ 208 323/3)

The default configuration of the Ethernet switch is set by both HW and SWITCHCONF FW after the power on reset. The list below shows the default configuration after this setting.

1. HOL Blocking prevention; OFF on all ports.
2. Back pressure, Flow control; ON on all ports.
3. QoS; OFF
4. Spanning tree; OFF
5. VLAN; OFF
6. Port trunking; OFF
7. Autonegotiation; ON
8. Port monitoring (sniffer); OFF
9. Network statistics; OFF
10. Maximal number of MAC addresses; 8k (Not possible to change in SW without a change in the HW)
11. MAC address ageing time; 100 — 200 sec.

5.2.5 Ethernet RP part

Autonegotiation is not supported, only 10BaseT half duplex is possible.

FW for RPB-E is not loaded in the SCB-RP flash memory from factory on all boards. Only ROJ 208 323/3 with revision R3 and higher can handle both RPB-E and RPB-S. On all other boards only RPB-S is supported in the FW from factory.

5.2.6 M-Bus Master part

SCB-RP can act as a master on the M-bus and collect product individual data, such as product number, revision, name, manufacturing data and serial number from the other boards in the subrack and send it to the CP. By order from the CP the SCB-RP can also control the MIA LED on the other boards.

Redundancy is not supported on the M-bus so in a normal configuration with two SCB-RPs, each will handle about half of the boards in the subrack.

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5.2.7 TS-HOD 500 Distribution module

The SCB-RP has two independent distribution modules with a -48V power filter for TS-HOD500, Two Stage High Ohmic Distribution. Each can distribute up to 500W. It is not possible to connect them together so the power supply in GEM is split in one left and one right half of the subrack.

A pair of SCB-RPs can supply a redundant power connection to all the boards in a subrack.

The power supervision function can detect a power failure on either one of the four -48 V power buses in the backplane.

5.2.8 Ordering parameters and Characteristics

See Application Information 155 18-CNZ 212 336.

6 REFERENCES

- a** 1/155 19-APZ 211 11 Uen The Physical and Data Link Layers on the Serial RP-bus, RPB-S
- b** 2/155 19-APZ 211 11 Uen Network layer protocol on serial RP-bus, RPB-S
- c** 4/155 19-APZ 212 20 Uen Maintenance bus, MB
- d** 1/1551-CSH 103 04 Uen TS-HOD Two-Step High-Ohmic Distribution system
- e** 1551-BYB 501 Uen BYB 501 Equipment practice
- f** 155 18-CNZ 212 330 Regional Processor Integrated Hardware, RPIHW
- g** 155 18-CNZ 212 336 Support and Connection Board Hardware, SCBHW
- h** 1551-ROJ 208 323/1 Product Description ROJ 208 323/1 SCB-RP
- i** 1551-ROJ 208 323/2 Product Description ROJ 208 323/2 SCB-RP
- j** 1551-ROJ 208 323/3 Product Description ROJ 208 323/3 SCB-RP
- k** 1070-ROJ 208 323/1 Cable Information SCB-RP
- l** 1070-ROJ 208 323/2 Cable Information SCB-RP
- m** 1070-ROJ 208 323/3 Cable Information SCB-RP

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7 GLOSSARY

CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CP	Central Processor
EM	Extension Module
FW	Firmware (SW loaded on the board from factory)
GEM	Generic Ericsson Magazine
HOL Blocking	Head Of Line Blocking
HW	Hardware
LAN	Local Area Network
LED	Light Emitting Diode
M-bus	Maintenance Bus
MTBF	Mean Time Between Failures
MIA	Manual Intervention Acknowledged
PIU	Plug In Unit
QoS	Quality of Service
RP	Regional Processor
RPB	Regional Processor Bus
RPB-E	RPB of Ethernet type
RPB-S	RPB of Serial type
RPB-S1	RPB-S no. 1, Incoming on cable to and from CP/RPH
RPB-S2	RPB-S no. 2, Incoming on cable to and from CP/RPH
RPB-S3	RPB-S no. 3, Incoming on cable to and from CP/RPH
RPB-S4	RPB-S no. 4, Incoming on cable to and from CP/RPH
RPB-S/I	RPB-S, Incoming on cable to and from CP/RPH or preceding RP on the bus branch

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RPB-S/M	RPB-S, Magazine internal to and from one path in the backplane
RPB-S/O	RPB-S, Outgoing on cable to and from next RP on the bus branch
RPIHW1A	Regional Processor Integrated Hardware type 1A
SCBHW	Support and Connection Board HardWare
SCB-RP	Support and Connection Board with an RP
SNMP	Simple Network Management Protocol
SW	Software
TS-HOD	Two Stage High Ohmic Distribution
TS-HOD500	Two Stage High Ohmic Distribution with 500W
VLAN	Virtual LAN