0.0 BaBar EMC DAQ Context

Flattened View of the EMC:

- Incident Energy
- CsI Crystal Detectors
- Photo-diode
- 6660 crystals
- 280 Trigger Towers
- 2 DAQ fibres
- 3 crystals in \( \phi \), 8 crystals in \( \theta \) (in the barrel)
- Read Out Module
- Forward
- Backward

Connections:
- Fast Control
- Environmental Monitoring
- DAQ
- Trigger
- Power
- Bias Voltage

DAQ Crate
The backward end-cap has been staged. The electronics must, however, be designed to accommodate it at a later date.

1.3 will not be expanded further, it is believed to be identical to 1.2.
1.1 Barrel EMC DAQ

Because the off-detector electronics is housed in standard VME crates the power connections are not shown explicitly.

The Fast Control Link Driver is a DAQ board with the SVT/DIRC/IFR/ATC DAQ personality board.
1.1.1 Barrel On-Detector Electronics

Photodiode output

1.1.1.1 Pre-amp Board (5760)
- Shaper Output
- Calibration

1.1.1.2 ADC Board (480)
- ADC Data
- ADC Control
- Cal Strobe
- Fast Control Register Write and Readback

1.1.1.3 B-IOB (80)
- E–LINK
- E–LINK
- 240

1.1.1.4 Transition Board (8)

EMB (?)

DAQ fibres

Front-end Fast Control Link

Environmental Monitoring

Sensor (temperature, humidity)
1.1.1.1 Pre-amplifier Board

FET

Photodiode output

Pre-amp IC

Calibration select, volt, strobe

x1,x32 Shaper Outputs

+6V
1.1.1.2 ADC Board

x1,x32 Shaper Outputs from two diodes per crystal

CARE IC (1 per 4 crystals)

10 bit ADC

Formatter (one per 4 ADCs)

Calibration Generation

Calibration select, volt, strobe (4)

Cal Strobe (4)

Cal Voltage

Power supplies, control and status related voltages to be digitised on the IOB

Env Mon MUX

Env Mon Voltages

Env Mon Select

ADC Control

ADC Data

CARE Control Register Write and Readback
1.1.1.4 Transition Board

- G-Link Serial to Parallel Converter
- Finisar Optical to Electrical Converter
- Front-end Fast Control Link (RX)
- G-Link Parallel to Serial Converter
- Finisar Electrical to Optical Converter
- Front-end Fast Control Link (TX)
- Environmental Monitoring Register
- E–LINK

Fast Control TX

Fast Control RX
1.1.2 Read-Out Modules

2 DAQ Fibres

1.1.2.1 Personality Board

2 Trigger Tower Sums to trigger

Data

Control

DAQ Board

DAQ

Sharing of neighbour information between DAQ boards is not shown.
1.1.2.1 EMC Personality Board

- DAQ fibre to DAQ fibre
- Finisar Optical to electrical Converter
- G-LINK Serial to Parallel Converter
- Packet Deformat
- Data correction (LUT)
- Trigger Summer
- Control
- Data
- Trigger Tower Sum
- Neighbour information
1.2 End-cap EMC DAQ

The Fast Control Link Driver is a DAQ board with the SVT/DIRC/IFR/ATC DAQ personality board.

Because the off-detector electronics is housed in standard VME crates the power connections are not shown explicitly.
1.2.1 End-cap On-Detector Electronics

- **Photodiode output**
  - 900

- **Pre-amp Board (900)**
  - Shaper Output
  - Calibration

- **ADC Board (80)**
  - ADC Data
  - ADC Control
  - Cal Strobe

- **E–IOB (20)**
  - Fast Control Register Write and Readback

- **Transition Board (2)**
  - E–LINK

- **EMB (2)**
  - Environmental Monitoring

- **Front-end Fast Control Link**

The B–IOB and E–IOB are identical as far as these block diagrams are concerned.