



FIC

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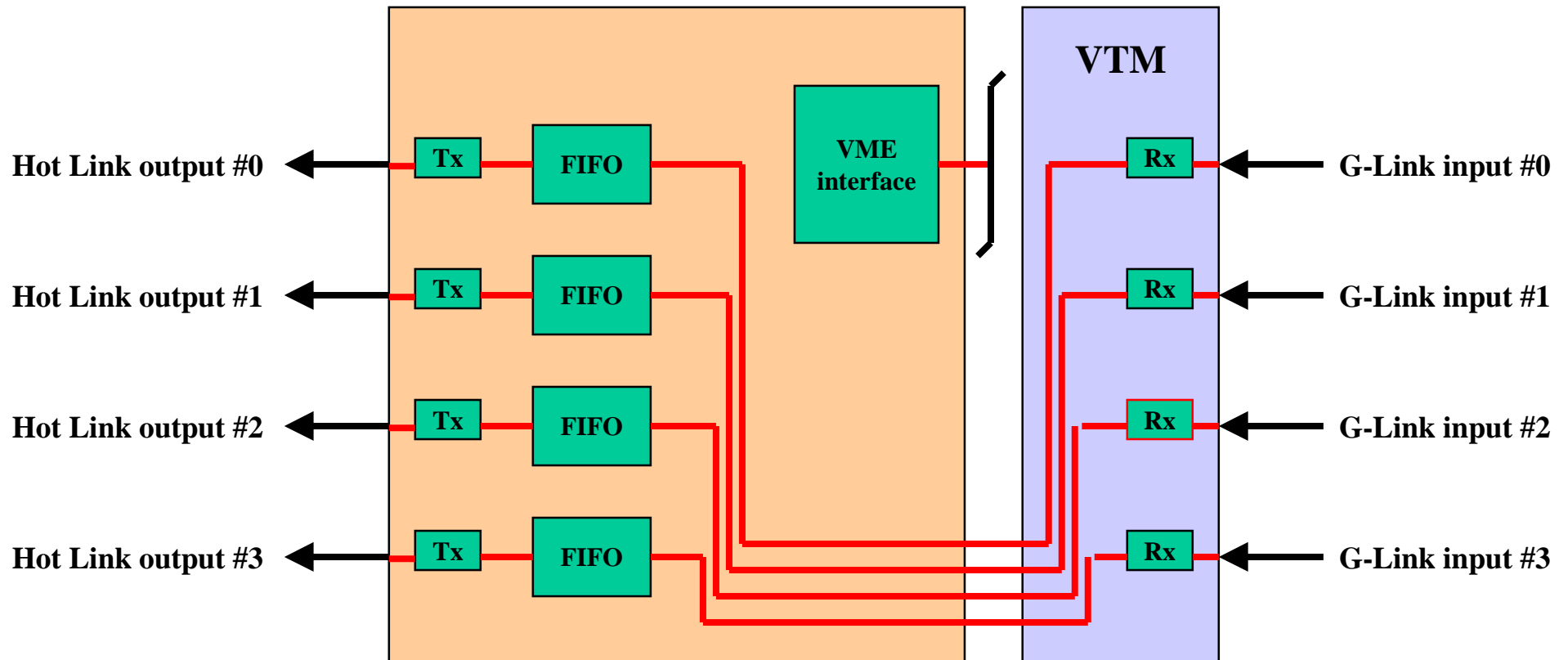


Requirements

- Bridge between G-Link from central trackers and standard level2 links (Hot-link).
- Simple card: can work without computer. Reuse standard VTM G-Link receiver.
- Performs protocol conversion.
- Provides monitoring information.

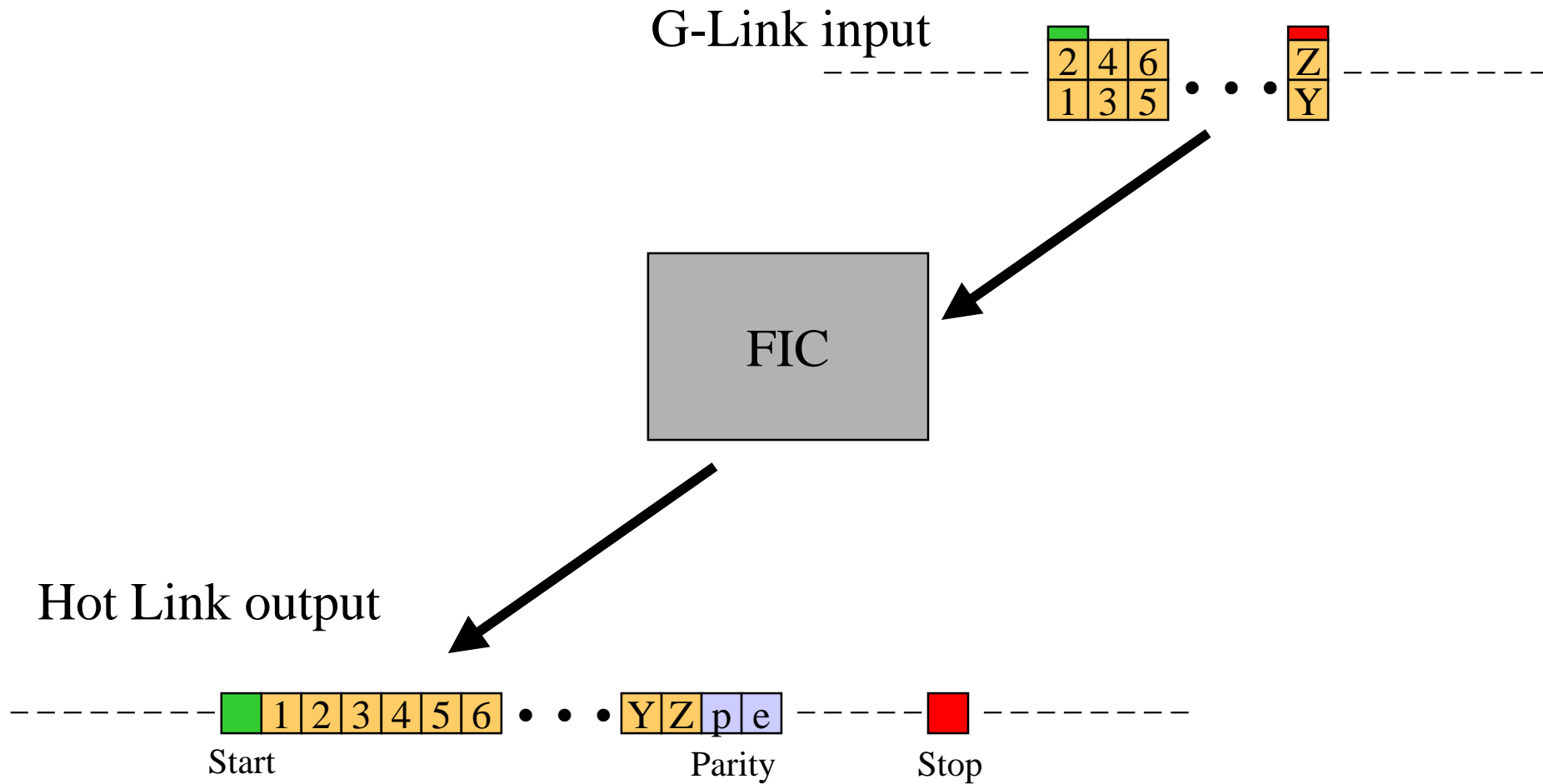


Block Diagram





Protocol Conversion





Monitoring in FIC

- Current status of all links.
 - ✦ Ready indicators, FIFO Flags.
 - ✦ Input and output states.
 - ✦ Error counters, incl.. overflow latches.
 - ✦ Events counters , incl.. overflow latches.
- Occupancy histogram:
 - ✦ Only Max occupancy of the four channels.
 - ✦ Five bins: 0, 1, 2/3, 4-7, ≥ 8 .
 - ✦ Update frequency: 500Hz.



Error detection

Error recovery

- Errors taken into account:
 - ✦ Invalid character received from G-Link.
 - ✦ Protocol errors on G-Link.
 - ✦ Buffer overflow (FIFO full or Event counter overflow).
- Tool for error diagnosis: output parity.
- Error diagnosis and recovery done in software in the Alphas.



Link Debugging Strategy

- Find which link is in default (G-Link or Hot Link).
 - ✦ Check intermediate parity.
 - ✦ Check error indicators from both links.
- Try to re-initialise the bad link.
- After Hot Link re-initialisation, run BIST to check link quality.



VME Control

- General controls
 - ✦ Reset, Test modes.
 - ✦ Clear of monitoring counters.
 - ✦ Serial communication with VTM.
- Monitoring
- Debugging
 - ✦ Full and independent control of both links



VME Interface

	31	23	15	7	
ad 00	CTL	Serial	unused	WFx	
ad 04	unused	Flags	FSM	FIFOx	
ad 08	FIFO0		FIFO1		
ad 0C	FIFO2		FIFO3		
ad 10	Cnt0	Cnt1	Cnt2	Cnt3	
ad 14	Flag0	Flag1	Flag2	Flag3	
ad 18	Err0	Err1	Err2	Err3	
ad 1C	Histo0		Histo1		
ad 20	Histo2		Histo4		
ad 24	Histo8		OvHist		
ad 28	FIFO0		FIFO1		
ad 2C	FIFO2		FIFO3		



Demonstrator and Test Bench

- Development under way. Already usable for the FIC prototype.
- Software written in LabWindow. Style foreseen for easy portage to D0 on-line environment.
- Designed to check functionality and correctness. Not suitable for performance measurements.