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Mini FieldHub User Manual

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Used abbreviations:

AC	Alternating Current	
DC	Direct Current	
CPLD	Complex Programmable Logic Device	
IRIGB	Inter Range Instrumentation Group Timecode	
PCB	Printed Circuit Board	
UART	Universal Asynchronous Receiver Transmitter	
USB	Universal Serial Bus	
FBAP	FieldHub Backplane	

History			
Version	Date	Observation	
1.0	2024-07-18	Draft	
1.1	2024-07-24	See page 3, Expected IRIGB output, static 32 seconds added	

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1 Introduction

The FBAP-mini is an active backplane to be mounted in 3u-high crates. Equipped with up to two FDOR cards, small test setups (8 wire pairs) can be established. It is a universal test platform, for in-ice devices, FDOR cards and corresponding firmware / software. Unfortunately the FDOR cards got front plates with an offset of 0.1", preventing the cards from being plugged. Either one has to dismount the FDOR front panels or to drill, e.g. 2x3 new backplane mounting holes with an offset of 0.1".

2 Power Supply

An external DC power supply, +/-40V to +/-80V is required. At the backplane end M4 ring terminals or a connector TE 1-178128-3 can be used.



3 10MHz Clock and IRIGB

A onboard CPLD generates 10MHz and an IRIGB signal from a precision clock oscillator (ML602-020.0M). Due to the limited CPLD recources the IRIGB signal is semi-static, means only the seconds of the day are being counted up. The programmed IRIGB string is: **191 days : 14 hours : 08 minutes : 32 seconds + straight binary seconds of the day** (0 to 86.399).

The IRIGB Format (BCD encoded, e.g.: 091 Days : 14 Hours : 08 Minutes : 32 Seconds) is shown below:



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4 IRIGB Signal and the 10MHz Clock to IRIGB Phase Relationship

See measurements below, encoding: 2ms = '0', 5ms = '1', 8ms = Reference Marker, 2x8ms = start of the frame.

10MHz and IRIGB measured on the FDOR card.



5 Onboard Connectors and Jumpers



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6 Jumper Settings

See below, blue jumpers, local 10MHZ and IRIGB signals are selected. For external set the jumpers to their lower positions. Green jumper, bit $CN0_SLOT_ADR_4 = `0`$, else `1'. Red jumpers, the +12V on the FDOR card is enabled.



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7 External 10MHz and IRIGB

When using external 10MHz clock and IRIGB sources (blue jumpers in lower positions), be sure to get a signal level of 3.4V to 5V at 50 Ohm load. Otherwise you might have to modify the resistor divider R1/R3 and R2/R4, see below. The minimum required input high-level VIH for the DS90LV017 is 2.0V.

