HW-SW ICD

OTS

Rev 1.0

|  |  |  |  |
| --- | --- | --- | --- |
| R E V I S I O N S | | | |
| **REV.** | **DESCRIPTION** | **RELEASE DATE** | **CHANGES DESCRIPTION** |
| 1 |  | 22/12/2019 | First Release |
|  |  |  |  |
|  |  |  |  |

The following document describes the connections and functionality of peripheral devices, connected to the MCU

Contents

[1 FPGA 3](#_Toc53217520)

[1.1.1 Test\_Register 4](#_Toc53217521)

[1.1.2 Hardware Revision Register 4](#_Toc53217522)

[1.1.3 Discretes Aircraft to OTB-B (1) : disc\_ac\_2\_otbb\_reg1 5](#_Toc53217523)

[1.1.4 Discretes Aircraft to OTB-B (2) : disc\_ac\_2\_otbb\_reg2 5](#_Toc53217524)

[1.1.5 Discretes Aircraft to OTB-C : disc\_ac\_2\_otbc\_reg 5](#_Toc53217525)

[1.1.6 Discretes Test OTB-C : disc\_tst\_c\_rd 5](#_Toc53217526)

[1.1.7 SERDES SFP Status : serdes\_sfp\_stat 6](#_Toc53217527)

[1.1.8 RS422 Test Register : rs422\_test\_sig 7](#_Toc53217528)

[1.1.9 On Board LEDS Register : leds\_register 7](#_Toc53217529)

[1.1.10 SERDES1 Control Register : ser1\_control 7](#_Toc53217530)

[1.1.11 SERDES2 Control Register : ser2\_control 7](#_Toc53217531)

[1.1.12 Discretes Out Write Register 7](#_Toc53217532)

[1.1.13 Photo Diode TEC Control Register : phd\_tec\_cont 8](#_Toc53217533)

[1.1.14 SFP TEC Control Register : sfp\_tec\_cont 8](#_Toc53217534)

[2 Non FPGA 9](#_Toc53217535)

[2.1.1 Debug UART 9](#_Toc53217536)

[2.1.2 SPI Master To FPGA 9](#_Toc53217537)

[2.1.3 Ethernet SFP Control Signals 9](#_Toc53217538)

[2.1.4 DC Power Supply Power Good Signals 10](#_Toc53217539)

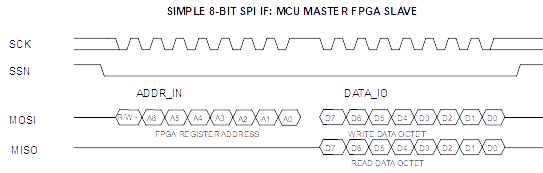
[2.1.5 Serial FLASH 10](#_Toc53217540)

[2.1.6 Onboard LEDs 10](#_Toc53217541)

[2.1.7 SFP Temperature Reading 10](#_Toc53217542)

# FPGA

SPI is 8bit rising edge normally 1



|  | | | |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## Test\_Register

Address 0, Read & Write

Value previously written into this register can be written.

## Hardware Revision Register

Address 1, Read Only

Read current hardware revision.

## Discretes Aircraft to OTB-B (1) : disc\_ac\_2\_otbb\_reg1

Address 2, Read Only

Read back output discretes values for BIT.

D7 Constant '0'

D6 TEST\_INB2

D5 TEST\_INB1

D4 TRDS\_SPARE

D3 TRDS\_TOP\_GIC

D2 TRDS\_TI

D1 TRDS\_T2\_TE

D0 TRDS\_T1\_TE

## Discretes Aircraft to OTB-B (2) : disc\_ac\_2\_otbb\_reg2

Address 3, Read Only

Read back output discretes values for BIT.

D7-D3 Constant "00000"

D2 TEST\_RSTOT

D1 RSV2OTB

D0 RSV1OTB

## Discretes Aircraft to OTB-C : disc\_ac\_2\_otbc\_reg

Address 4, Read Only

Read back output discretes values for BIT.

D7 Constant '0'

D6 TEST\_INC2

D5 TEST\_INC1

D4 CDFRALBJP

D3 LBJP\_RI\_MB

D2 LBJP\_RI\_LB

D1 LBJP\_TI\_MB

D0 LBJP\_TI\_LB

## Discretes Test OTB-C : disc\_tst\_c\_rd

Address 5, Read Only

Read back output discretes values for BIT.

D7-D4 Constant "0000"

D3 LBJP\_RW\_MB\_BIT

D2 LBJP\_RW\_LB\_BIT

D1 LBJP\_TR\_MB\_BIT

D0 LBJP\_TR\_LB\_BIT

## SERDES SFP Status : serdes\_sfp\_stat

Address 6, Read Only

Read SFP Status Bits.

D7-D4 Constant "0000"

D3 SER2\_TXFLT

D2 SER2\_LOS

D1 SER1\_TXFLT

D0 SER1\_LOS

## RS422 Test Register : rs422\_test\_sig

Address 16, Write Only

D4 TEST\_INB1P

D3 TEST\_INB2P

D2 TEST\_INC1P

D1 TEST\_INC2P

D0 TEST\_RSTOT\_P

## On Board LEDS Register : leds\_register

Address 17, Write Only

D2 LED2

## SERDES1 Control Register : ser1\_control

Address 18, Write Only

D5 SER1\_PRBSEN

D4 SER1\_LOCREFN

D3 SER1\_ENABLE

D2 SER1\_TX\_ER

D1 SER1\_LOOPEN

D0 SER1\_TXDIS

## SERDES2 Control Register : ser2\_control

Address 19, Write Only

D5 SER2\_PRBSEN

D4 SER2\_LOCREFN

D3 SER2\_ENABLE

D2 SER2\_TX\_ER

D1 SER2\_LOOPEN

D0 SER2\_TXDIS

## Discretes Out Write Register

Address 20, Write Only

Write output discretes from Aircraft for IBIT.

D7 DISC\_OUT\_INITEN: ‘1’ Disconnect from SERDES RX and write INIT Value (hard wired)

D6 DISC\_OUT\_SETEN: ‘1’ Disconnect from SERDES RX and write from Aircraft

D5-D4 Constant "0000"

D3 LBJP\_TR\_LB\_SET discrete value write

D2 LBJP\_RW\_LB\_SET discrete value write

D1 LBJP\_TR\_MB\_SET discrete value write

D0 LBJP\_RW\_MB\_SET discrete value write

## Photo Diode TEC Control Register : phd\_tec\_cont

Address 21, Write Only

D7 phd\_tec\_cool ‘1’ for cooling, ‘0’ for heating

D6-D0 phd\_tec\_pwm PWM value from minimum to maximum

## SFP TEC Control Register : sfp\_tec\_cont

Address 22, Write Only

D7 sfp\_tec\_cool ‘1’ for cooling, ‘0’ for heating

D6-D0 sfp\_tec\_pwm PWM value from minimum to maximum

# Non FPGA

## Debug UART

LVCMOS 3.3V UART

DBG\_UART\_TX MCU PA9

DBG\_UART\_RX MCU PA1

## SPI Master To FPGA

FPGA\_SPI\_CLK MCU PA5

FPGA\_SPI\_MISO MCU PA6

FPGA\_SPI\_MOSI MCU PB5

FPGA\_SPI\_CS MCU PA15

## Ethernet SFP Control Signals

P9\_0\_TXDIS MCU PE3 Write – Transmit Disable

P9\_0\_TXFLT MCU PE4 Read – TX Fault detected

P9\_0\_LOS MCU PE5 Read – RX LOS was detected

P9\_1\_TXDIS MCU PE6 Write – Transmit Disable

P9\_1\_TXFLT MCU PE7 Read – TX Fault detected

P9\_1\_LOS MCU PE8 Read – RX LOS was detected

P9\_2\_TXDIS MCU PE10 Write – Transmit Disable

P9\_2\_TXFLT MCU PE11 Read – TX Fault detected

P9\_2\_LOS MCU PE12 Read – RX LOS was detected

## DC Power Supply Power Good Signals

P5V0\_PG MCU PH8

M5V0\_PG MCU PH9

P3V3\_PG MCU PH10

M3V3\_PG MCU PH11

PG\_2V5 MCU PH12

PG\_1V8 MCU PH13

PG\_1V5 MCU PH14

PG\_1V1 MCU PH15

## Serial FLASH

See M24512-DRDW3TP data sheet

EE\_SCL MCU PB8

EE\_SDA MCU PB9

## Onboard LEDs

“0” is ON

--LED1 MCU PI1

--LED2 MCU PI4

--LED3 MCU PI9

--LED4 MCU PI11

## SFP Temperature Reading

OPT\_ADC\_SEL MCU P12 Should be ‘1’ to select SFP\_TEMP\_SNS input.

OPT\_ADC\_SCLK MCU PB6 ADS8681IPWR ADC signal

OPT\_ADC\_SYNC MCU PB11 ADS8681IPWR ADC signal

OPT\_ADC\_SDIN MCU PB7 ADS8681IPWR ADC signal

OPT\_ADC\_RST MCU PB2 ADS8681IPWR ADC signal