

example_module

Address width: 32

Data width: 32

Base address: 0xFFAA0000

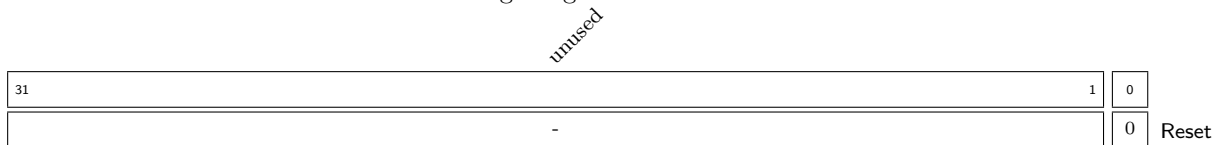
An example module that contain all the register types that are currently supported by bust.

1 Register List

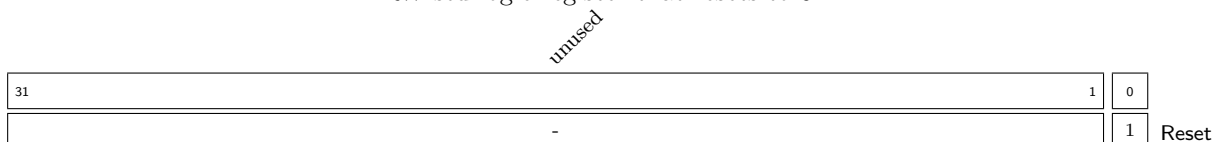
#	Name	Mode	Address	Type	Length	Reset
0	reg0	RW	0x00000000	SL	1	0x0
1	reg1	RW	0x00000004	SL	1	0x1
2	reg2	RO	0x00000008	SL	1	0x0
3	reg3	RW	0x0000000C	SLV	8	0x3
4	reg4	RO	0x00000010	SLV	14	0x0
5	reg5	RW	0x00000014	DEFAULT	32	0xFFFFFFFF
6	reg6	RO	0x00000018	DEFAULT	32	0x0
7	reg7	RW	0x0000001C	FIELDS	21	0xAD7
8	reg8	RO	0x00000020	FIELDS	24	0x0
9	reg9	PULSE	0x00000024	SL	1	0x1
10	reg10	PULSE	0x00000028	SLV	4	0xA
11	reg11	PULSE	0x0000002C	FIELDS	16	0x3

2 Registers

Register 2.1: REG0 - RW (0x00000000)
RW std_logic register that resets to 0x0



Register 2.2: REG1 - RW (0x00000004)
RW std_logic register that resets to 0x1



Register 2.3: REG2 - RO (0x00000008)
RO std_logic register

31	1	0
-	0	Reset

Register 2.4: REG3 - RW (0x0000000C)
RW std_logic_vector[7:0] register that resets to 0x3

31		8	7	0

Register 2.5: REG4 - RO (0x00000010)
RO std_logic_vector[13:0]

31		14		13		0	
				0x0		Reset	

Register 2.6: REG5 - RW (0x00000014)
Default RW register that resets to 0xFFFFFFFF

31	0
0xFFFFFFFF	Reset

Register 2.7: REG6 - RO (0x00000018)
Default RO register

31	0
0x0	Reset

Register 2.8: REG7 - RW (0x0000001C)
RW register that have multiple fields

unused		field3		field2	field1		field0	
31	21	20	6	5	4	1	0	
-		0x2B		0	0xB		1	
								Reset

field0 std_logic that resets to 0x1

field1 std_logic_vector[3:0] that resets to 0xb is not a valid reset value

field2 std_logic that resets to 0x1

field3 std_logic_vector[14:0] that resets to 0x2b

Register 2.9: REG8 - RO (0x00000020)
RO register with multiple types of fields

unused				field3		field2	field1															field0	
3124				23	21	20	191															0	
-				0x0		0	0x0															0	Reset

field0 std_logic field

field1 std_logic_vector[18:0] field

field2 std_logic field

field3 std_logic_vector[2:0] field

Register 2.10: REG9 - PULSE FOR 4 CYCLES - (0x00000024)
PULSE std_logic register that resets to 0x1

unused																31	1			0		
																			-	1	Reset	

Register 2.11: REG10 - PULSE FOR 1 CYCLES - (0x00000028)
PULSE std_logic_vector[3:0] register that resets to 0xA

unused																31	4			3	0
																			-	0xA	Reset

Register 2.12: REG11 - PULSE FOR 50 CYCLES - (0x0000002C)
PULSE register with two fields

unused																field1		field0																	
31																16		15		14														0	
-																0		0x3														Reset			

field0 std_logic_vector[14:0] field that resets to 0x3

field1 std_logic field that resets to 0x0

3 Example VHDL Register Access

All registers are bundled in records based on their mode. E.g. all RW registers are accessed through the record *bustype_rw_regs*. Access is also dependent on the type of register. All register of type SL, SLV and DEFAULT are all directly accessed by just specifying the mode record signal. E.g. the RW register *reg0* can be assigned a value like this (assuming AXI-bus):

```
axi_rw_regs.reg0 <= (others => '0');
```

Registers of type FIELD cannot be directly accessed without specification of a certain field. This is because the registers are implemented as a record in VHDL (thus a record of records). E.g. if the RO register *reg1* contains the field *field3* it can be accessed like this (assuming AXI-bus):

```
axi_ro_regs.reg1.field3 <= (others => '0');
```