# COBRA Connect BDM Interface
Product Information 1.2: 2007/01/22

COBRA Connect Features:

- Background Debug Mode (BDM) to PC Parallel Port Interface for Freescale ColdFire® Processors
- Suitable for Freescale ColdFire® Processors up to 266 MHz Clock and 3.3 V Pad Voltage
- Compatible with the Standard Parallel Port Wiggler
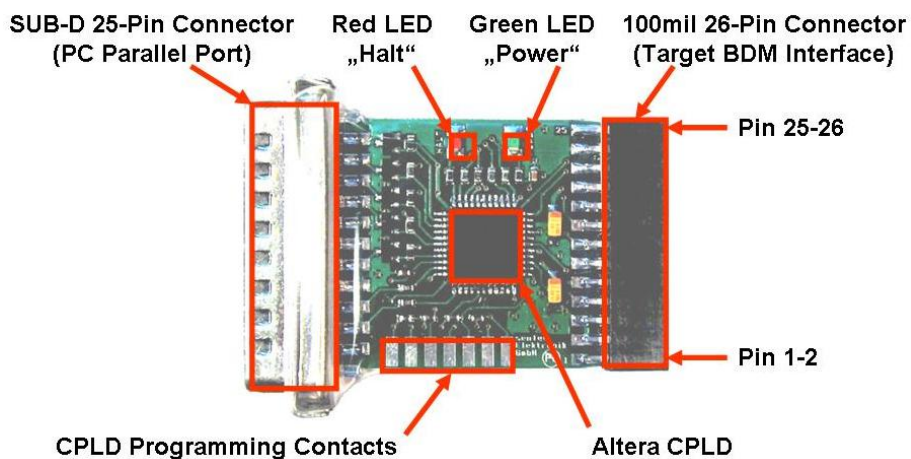- Works with all COBRA Processor Modules (COBRA = ColdFire® Board for Rapid Applications)
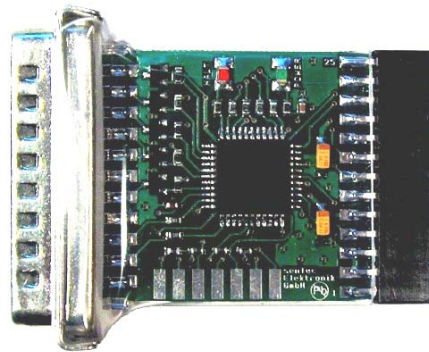
Original Size 34 mm x 56 mm
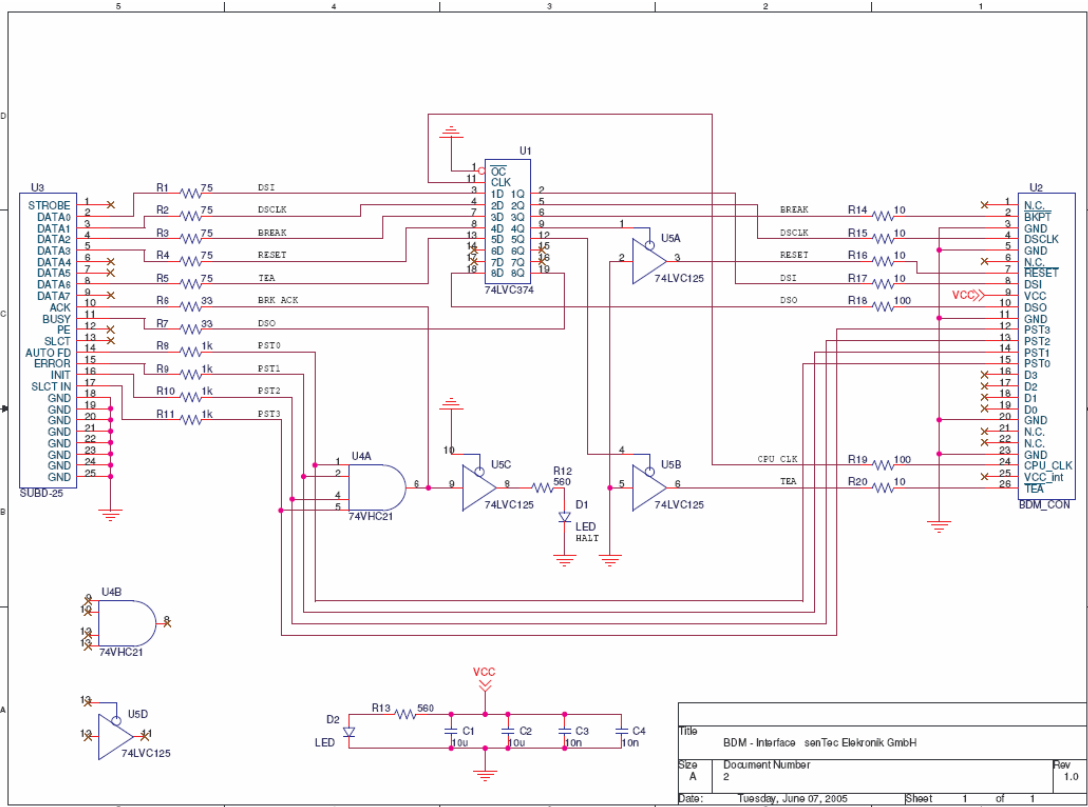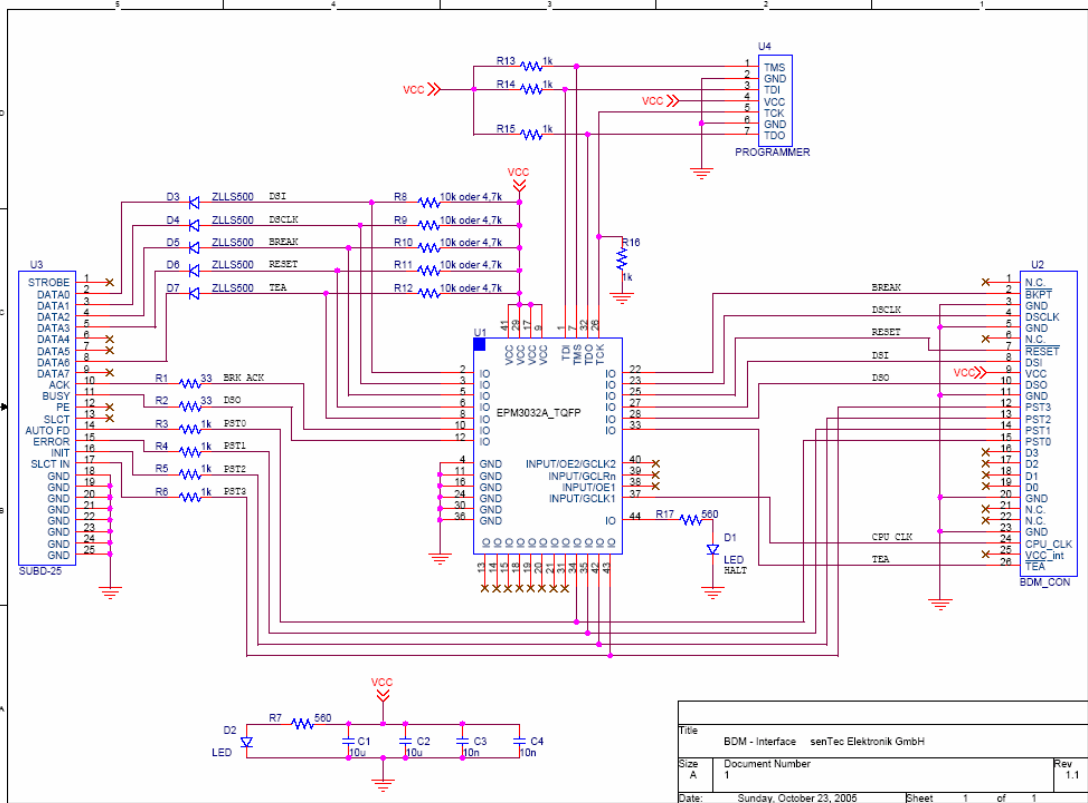

Tested with:

- GNU Compiler (gcc)
- GNU Debugger (gdb)
- Freescale CodeWarrior
- CF flasher, BDM Flasher
- Processors: MCF5206E, MCF5213, MCF5272, MCF5282, MCF5235, MCF5485, MCF5329; MCF52235

SUB-D 25-Pin Connector (PC Parallel Port)
Red LED „Halt"
Green LED „Power"
100mil 26-Pin Connector (Target BDM Interface)
Pin 25-26
Pin 1-2
CPLD Programming Contacts
Altera CPLD

COBRA Connect Principal Functional Schematic (discrete Logic)

U1
OC
CLK
1D 1Q
2D 2Q
3D 3Q
4D 4Q
5D 5Q
6D 6Q
7D 7Q
8D 8Q
74LVC374

U3
STROBE
DATA0
DATA1
DATA2
DATA3
DATA4
DATA5
DATA6
DATA7
ACK
BUSY
PE
SLCT
AUTO FD
ERROR
INIT
SLCT IN
GND
GND
GND
GND
GND
GND
GND
GND
SUBD-25

R1 75 DSI
R2 75 DSCLK
R3 75 BREAK
R4 75 RESET
R5 75 TEA
R6 33 BRK ACK
R7 33 DSO
R8 1k PST0
R9 1k PST1
R10 1k PST2
R11 1k PST3

U5A 74LVC125
U5B 74LVC125
U5C 74LVC125
U5D 74LVC125
U4A 74VHC21
U4B 74VHC21

BREAK R14 10
DSCLK R15 10
RESET R16 10
DSI R17 10
DSO R18 100
CPU_CLK R19 100
TEA R20 10

R12 560
D1 LED HALT

VCC

U2
N.C.
BKPT
GND
DSCLK
GND
N.C.
RESET
DSI
VCC
DSO
GND
PST3
PST2
PST1
PST0
D3
D2
D1
D0
GND
N.C.
N.C.
GND
CPU_CLK
VCC_int
TEA
BDM_CON

D2 LED R13 560 C1 10u C2 10u C3 10n C4 10n

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Size A
Document Number 2
Rev 1.0
Date: Tuesday, June 07, 2005
Sheet 1 of 1

COBRA Connect Actual Schematic (Implementation with CPLD)

U4
TMS
GND
TDI
VCC
TCK
GND
TDO
PROGRAMMER

R13 1k
R14 1k
R15 1k
R16 1k
VCC

U3
STROBE
DATA0
DATA1
DATA2
DATA3
DATA4
DATA5
DATA6
DATA7
ACK
BUSY
PE
SLCT
AUTO FD
ERROR
INIT
SLCT IN
GND
GND
GND
GND
GND
GND
GND
GND
SUBD-25

D3 ZLLS500 DSI R8 10k oder 4,7k
D4 ZLLS500 DSCLK R9 10k oder 4,7k
D5 ZLLS500 BREAK R10 10k oder 4,7k
D6 ZLLS500 RESET R11 10k oder 4,7k
D7 ZLLS500 TEA R12 10k oder 4,7k

U1
EPM3032A_TQFP
VCC VCC VCC VCC
TDI TMS TDO TCK
IO
INPUT/OE2/GCLK2
INPUT/GCLRn
INPUT/OE1
INPUT/GCLK1
GND

R1 33 BRK ACK
R2 33 DSO
R3 1k PST0
R4 1k PST1
R5 1k PST2
R6 1k PST3

R17 560
D1 LED HALT

BREAK
DSCLK
RESET
DSI
DSO
CPU CLK
TEA

VCC

U2
N.C.
BKPT
GND
DSCLK
GND
N.C.
RESET
DSI
VCC
DSO
GND
PST3
PST2
PST1
PST0
D3
D2
D1
D0
GND
N.C.
N.C.
GND
CPU_CLK
VCC_int
TEA
BDM_CON

D2 LED R7 560 C1 10u C2 10u C3 10n C4 10n

Title BDM - Interface senTec Elektronik GmbH
Size A
Document Number 1
Rev 1.1
Date: Sunday, October 23, 2005
Sheet 1 of 1

100mil 26-Pin Target BDM Interface Connector

Nr.	Name	Direction	Description
1	N.C.	-	-
2	/BKPT	Processor in	/Breakpoint
3	GND	Ground	Ground
4	DSCLK	Processor in	Debug Data Clock In
5	GND	Ground	Ground
6	N.C.	-	-
7	/RESET	Processor in	/Reset
8	DSI	Processor in	Debug Data Serial In
9	VCC	-	VCC Processor Pads (3.3V)
10	DSO	Processor out	Debug Data Seriel Out
11	GND	Ground	Ground
12	PST3	Processor out	Processor Status Pin 3
13	PST2	Processor out	Processor Status Pin 2
14	PST1	Processor out	Processor Status Pin 1
15	PST0	Processor out	Processor Status Pin 0
16	D3	not used	Processor Data 3
17	D2	not used	Processor Data 2
18	D1	not used	Processor Data 1
19	D0	not used	Processor Data 0
20	GND	Ground	Ground
21	N.C.	-	-
22	N.C.	-	-
23	GND	Ground	Ground
24	CPU_CLK	Processor out	Processor Clock
25	VCC	N.C.	VCC Processor Core (1.5 – 3.3V)
26	/TEA	Processor in	/Transfer Error Acknowledge

SUB-D 25-Pin PC Parallel Port Connector

Nr.	Name on PC	Name	Direction	Description
1	- STROBE	N.C.	-	-
2	DATA 0	PC_DSI	PC out	Debug Data Serial In
3	DATA 1	PC_DSCLK	PC out	Debug Data Clock In
4	DATA 2	/PC_BREAK	PC out	/Breakpoint
5	DATA 3	/PC_RESET	PC out	/Reset
6	DATA 4	N.C.	-	-
7	DATA 5	N.C.	-	-
8	DATA 6	/PC_TEA	PC out	/Transfer Error Acknowledge
9	DATA 7	N.C.	-	-
10	- ACK	S_DSO	PC in	Debug Data Serial Out
11	+ BUSY	/BRK_ACK	PC in	Breakpoint Acknowledge
12	+ PE	N.C.	-	-
13	+ SLCT	PWR_ON	PC in	Power On
14	- AUTO FD	PST0	PC in	Processor Status Pin 0
15	- ERROR	PST1	PC in	Processor Status Pin 1
16	- INIT	PST2	PC in	Processor Status Pin 2
17	- SLCT IN	PST3	PC in	Processor Status Pin 3
18	GND		Ground	
19	GND		Ground	
20	GND		Ground	
21	GND		Ground	
22	GND		Ground	
23	GND		Ground	
24	GND		Ground	
25	GND		Ground	

COBRA Connect Description

The **COBRA Connect** is a Background Debug Mode (BDM) to PC Parallel Port Interface for Freescale ColdFire® Processors. It is suitable for ColdFire® Processors up to 266 MHz Clock and 3.3 V Pad Voltage. It is 100% compatible with the Standard Parallel Port Wiggler and works with all COBRA Processor Modules (COBRA = ColdFire® Board for Rapid Applications): COBRA5272, COBRA5282, COBRA5475, COBRA5485, COBRA5329, COBRA52235.

The **COBRA Connect** BDM Interface has been tested and works fine with the following tools: GNU Compiler (gcc), GNU Debugger (gdb), Freescale CodeWarrior, CF flasher, BDM Flasher. However, it should work also with all other tools compatible to the Standard PC Parallel Port Wiggler.

The **COBRA Connect** BDM Interface has been tested and works fine with the following Processors: MCF5206E, MCF5213, MCF52235, MCF5272, MCF5282, MCF5235, MCF5475, MCF5485, MCF5329. However, it should work also with other Freescale ColdFire® Processors. The 100mil 26-Pin Target BDM Interface Connector is compatible to the Freescale-Recommended BDM Pinout (26-pin Berg connector arranged 2 x 13) as described in the User's Manuals of the ColdFire® Processors.

When you connect the BDM interface to the target, please make sure that you connect pin 1 of the BDM interface connector to pin 1 of the target connector. There is no mechanical lock to prevent the BDM interface from reverse connection. If you connect the BDM interface to the target reversely, it will not be destroyed, but just will not work as expected.

The **COBRA Connect** BDM Interface is been powered from the debugged target. The power supply voltage should be within the range of 2.3 to 4.6 V. When a supply voltage is applied to the BDM interface, the green LED "Power" indicates that the BDM Interface is powered. The red LED "Halt" indicates that the processor is in halted state. If you connect the BDM interface to a target, power up the target and the green LED "Power" does not light up, check if you have connected the BDM interface the right way (or if it is reversed).

The **COBRA Connect** BDM Interface has been tested and works fine with the native Parallel Port of standard IBM-compatible Personal Computers and Notebooks. **However, it has not been tested with USB based Parallel Port Emulators! If you use a Parallel Port Emulator or a Port Replicator, the COBRA Connect BDM Interface may not work as expected.**

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Product status: development finished, product in qualification