

# ***INTRODUCTION***



*Development Tool for 80C51 Microcontrollers*

This catalog includes the description and specifications for all Ceibo Development Tools.

Systems are grouped in seven categories:

## **Development Boards:**

Systems used to build-up prototype and test basic principles for your idea. The boards offer software debugging capabilities and on-board expansion.

## **Low Cost Emulators:**

Simple, though sophisticated, in-circuit emulators that share some resources of the target microprocessor. Sometimes they become the unique available emulation option due to the lack of another solution. Low cost alternative to full featured systems.

## **In-Circuit Emulators:**

Completely transparent and real-time systems with trace and signal analysis of complex events. These are the most advanced tools for debugging your target circuit and software.

## **Programmers:**

The necessary equipment to have the firmware and logic circuits ready to be plugged into your application.

## **Peripheral Emulators:**

The necessary systems required for testing the implementation of programmable logic devices connected to the microprocessor bus. Include programs used to design the peripheral devices.

## **Development Software:**

A set of software tools and programming languages that allows assembling, compiling and debugging your software.

**Internet Solutions:**

TCP/IP protocols and hardware kits to develop internet connectivity.

**Mechanical Accessories:**

Socket and plug converters for different device packages.

**THE SYSTEMS**

Ceibo offers solutions for the above systems and for a broad line of different micro- processors. As every year many new microprocessors are released, the related development tools also evolve. Call Ceibo for the most updated list of available tools and supported devices.

<b>Type</b>	<b>System</b>	<b>Highlights</b>
<b>Development Boards</b>	DB-51	Prototype platform for most of the 8051 microcontroller derivatives
	DS-750	Dedicated to the 87C750. 40MHz real-time emulation with programming capabilities.
<b>Low Cost Emulator</b>	EB-51	Supports 8051 derivatives. ROMed and ROMless. 40MHz real-time emulation. 5V and 3.3V emulation
	EB-76X	Supports Philips Low Pin Count 8051s. Real-time and transparent emulation. Trace buffer included
	EB-XAV2	Emulator for all Philips XA microcontrollers. Supports 512K Code and Data Memory applications at 30MHz. Real time trace.
	EB-XAG3	Real-time emulation of P51XAG3 microcontrollers. Supports 64K code memory .applications. No trace.
	EB-XAG49	real-time emulation of P51XAG49 microcontrollers. Supports 64K code memory. No trace.
	EB-XAS3	Real-time emulation of P51XAS3 microcontrollers. Supports 64K code memory applications. No trace.
	EB-C251	Support for Intel MCS251 and Atmel C251Gx microcontrollers. Trace buffer available. Low cost emulator.
	EB-51X2	Supports Philips 89C51Rx2 microcontrollers and others with 6/12 Clocks/Cycle.
	EB-ST62	Supports STMicroelectronics ST62xx
	FE-C420	Development system for Dallas DS89C420.
	FE-51CC01	Development system for Atmel 89C51CC01.

<b>Type</b>	<b>System</b>	<b>Highlights</b>
	FE-51RD2	Development system for Atmel 89C51Rx2 - 44PLCC.
	FE-51RD2/68P	Development system for Atmel 89C51Rx2 - 68PLCC.
<b>In-Circuit Emulators</b>	DS-51	Supports most of the 8051 derivatives. 1.5V to 6V emulation. Windows and DOS debuggers.
	DS-251	Supports Intel and Atmel MCS251, C251Gx microcontrollers. Full featured emulator.
	DS-XA	Emulates all Philips P51XA 16-bit microcontrollers
	DS-186	Support for Intel, NEC and AMD 8086, 80186 and other microprocessors and derivatives. Paradigm software.
	DS-48	Supports Philips microcontrollers used in Telecom products. DS-M8 Emulates Microchip PIC microcontrollers.
	DS-M8	Emulates Microchip PIC microcontrollers
	DS-85	Emulator for 8085 microprocessors
<b>Programmiers</b>	MP-51	Microcontroller, Flash Memory, EPROM and PLD Programmer.
	MP-JTAG	JTAG interface device programmer. In-System programming support.
	DS-300	Emulator for PSD-3xx devices. Includes Windows configuration software.
<b>Development Software</b>	XA	Professional kit for windows including: ANSI C-compiler (16M), Assembler (16M), Linker, Librarian and Debugger/Simulator (16M).
	CA51	Full ANSI C-Compiler for the 8051 Family of microcontrollers, including Compiler, Assembler, Linker/Locator and full ANSI C Libraries.
	RKIT-ST6	ANSI C Compiler, a Macro-Assembler, a Linker and a Simulator/Debugger
<b>Mechanical Accessories</b>		
<b>Standard Adapters</b>	ADP-20D	40-DIP to 20-DIP
	ADP-20S	20-Dip to 20-SO
	ADP-24D	28-DIP to 24-DIP
	ADP-28P	28-DIP to 28-PLCC

<b>Type</b>	<b>System</b>	<b>Highlights</b>
<b>Advanced Adapters</b>	ADP-28P-751	28-DIP to 28-PLCC for 87C750/1
	ADP-40D	44-PLCC to 40-DIP
	ADP-44P	40-DIP to 44-PLCC
	ADP-44P-E	44-PLCC to 44-PLCC Extender
	ADP-44Q	40-DIP to 44-QFP
	ADP-44Q-P	44-PLCC to 44-QFP
	ADP-56V	row of pins to 56-VSO adapter
	ADP-64Q	row of pins to 64-QFP adapter
	ADP-80Q	row of pins to 80-QFP
	ADP-80Q-EB	68-PLCC to 80-QFP for 80C186EB
	ADP-100Q-SMC	row of pins to 100-QFP surface mounted clip
	ADP-100Q-AMP	row of pins to 100-QFP plug for AMP socket
	ADP-100Q-TEX	row of pins to 100-QFP plug for Textool socket
	ADP-100Q-SOL	row of pins to 100-QFP SMC soldered to pads
	ADP-100J-SMC	row of pins to 100-EIAJ surface mounted clip
ADP-100J-SOL	row of pins to 100-EIAJ SMC soldered to pads	
ADP-132Q	row of pins to 132-QFP	
Converters and Adapters	PLCC to PLCC and PGA to PLCC, DIP /shrink DIP to PLCC and PLCC to DIP/shrink DIP, PLCC to PGA, DIP to SOP/SO/SOIC and DIP to SOJ, SOP/SO/SOIC to DIP and SOJ to DIP, TSOP to DIP, PLCC to DIP and LCC to DIP, Programming Sockets, QFP-TEST Module, clip on and Accessories.	

## SUPPORTED MICROPROCESSORS AND MICROCONTROLLERS

$\mu\text{P}/\mu\text{C}$	Development Board	Low Cost Emulator	In Circuit Emulator	Programmer	SW
80C31/2	DB-51	EB-51	DS-51	-	CA51
8xC51/2/4/8	DB-51	EB-51	DS-51	MP-51	CA51
8xC51FA/B/C	DB-51	EB-51	DS-51	MP-51	CA51
8xC51GB	-	-	-	MP-51	CA51
8xC51RA/B/C	DB-51	EB-51	DS-51	MP-51	CA51
8xC51RA/B/C/D+	DB-51	EB-51	DS-51	MP-51	CA51
8xC51Rx2	DB-51	EB-51x2	DS-51	MP-51	CA51
		FE-51RD2			
80CL31/2	-	EB-51	DS-51	-	CA51
8xCL51/2	-	EB-51	DS-51	-	CA51
8xL51FA/B/C	-	EB-51	DS-51	MP-51	CA51
8xL52/4/8	-	EB-51	DS-51	MP-51	CA51
8xCL5134	-	-	DS-51	MP-51	CA51
8xCL5167/8	-	-	DS-51	-	CA51
8xCL267/8	-	-	DS-51	-	CA51
80C310,80C320	-	EB-51	DS-51	-	CA51
80C323	-	EB-51	DS-51	DS-51	CA51
8xCL410	-	EB-51	DS-51	-	CA51
8xCL434	-	-	DS-51	-	CA51
8xC451/3	DB-51	-	DS-51	MP-51	CA51
80C512/532	-	-	DS-51	-	CA51
80C515/535A	-	-	DS-51	-	CA51
80C517/537A	-	-	DS-51	-	CA51
8xC520/530	-	-	DS-51	MP-51	CA51
8xC524/528	DB-51	EB-51	DS-51	MP-51	CA51
89C536/8	-	EB-51	DS-51	MP-51	CA51
89C420	-	FE-C420	-	MP-51	CA51
8xC550	DB-51	EB-51	DS-51	MP-51	CA51
8xC552/4	DB-51	EB-51	DS-51	MP-51	CA51
8xCE558/9	-	-	DS-51	MP-51	CA51
8xCE560	-	-	-	MP-51	CA51
8xCE562	DB-51	EB-51	DS-51	-	CA51
8xC575	DB-51	-	DS-51	MP-51	CA51
8xC576	-	-	-	MP-51	CA51
8xCL580	-	-	DS-51	-	CA51
8xC592	-	-	DS-51	MP-51	CA51
8xCE598	-	-	DS-51	MP-51	CA51
8xC652/4	DB-51	EB-51	DS-51	MP-51	CA51
8xC66x	DB-51	EB-51X2	DS-51	MP-51	CA51
8xC748/9	DB-51	DS-750	DS-51	MP-51	CA51
				DS-750	
8xC750/1/2	DB-51	DS-750	DS-51	MP-51	CA51
				DS-750	
8xC754	-	-	-	MP-51	CA51
8xC764	-	EB-76X	DS-51	MP-51	CA51
8xC766	-	-	-	MP-51	CA51
8xC770	-	-	-	MP-51	CA51
8xCL781/2	-	EB-51	DS-51	-	CA51
8xCL834	-	-	DS-51	-	CA51
87CL880/1/3/4/6/7/8	-	-	-	MP-51	CA51

$\mu$ P/ $\mu$ C	Development Board	Low Cost Emulator	In Circuit Emulator	Programmer	SW
8xC054/5	-	-	DS-51	MP-51	CA51
89C51/2/5	-	EB-51	DS-51	MP-51	CA51
89S53	-	EB-51	DS-51	MP-51	CA51
89S8252	-	EB-51	DS-51	MP-51	CA51
89C1051/2051/4051	-	EB-51	DS-51	MP-51	CA51
P51XAG1/2/3x	-	EB-XA	DS-XA	MP-51	C-XA ASM-XA
P51XAS3x	-	EB-XA	DS-XA	MP-51	C-XA ASM-XA
P51XAG49	-	EB-XA	DS-XA	MP-51	C-XA ASM-XA
P51XAC3	-	EB-XA	DS-XA	MP-51	C-XA ASM-XA
8xC251SA/B/PQ	-	EB-C251	DS-251	MP-51	CA251
8xC251TA/B/PQ	-	EB-C251	DS-251	-	CA251
TSC8x251G1/2	-	EB-C251	DS-251	MP-51	CA251
TSC8x251G1D	-	EB-C251	DS-251	MP-51	CA251
8085	-	-	DS-85	-	-
8086/8,80C86/8	-	-	DS-186	-	Paradigm
80186/8,80C186/8	-	-	DS-186	-	Paradigm
80L186/8	-	-	DS-186	-	Paradigm
80C186/8/EA/EB/EC	-	-	DS-186	-	Paradigm
80C186/8/XL	-	-	DS-186	-	Paradigm
PCA5007/10	-	-	-	MP-51	CA51
PCA5097	-	-	-	MP-51	CA51
PCD509x7	-	-	-	MP-51	CA51
PCD6002	-	-	-	MP-51	CA51
PCD3315A	-	-	DS-48	-	2500AD
PCD3343/4/5/8/9A	-	-	DS-48	-	2500AD
PCD3350/1/2/3/4A	-	-	DS-48	-	2500AD
PCD3745A	-	-	DS-48	MP-51	2500AD
PCD3755/6A	-	-	DS-48	MP-51	2500AD
PCD88x	-	-	-	MP-51	-
PCF84C00	-	-	DS-48	-	2500AD
PCF84C21/41/81A	-	-	DS-48	-	2500AD
PIC12C508/9	-	-	DS-M8	-	-
PIC12CE518/9	-	-	DS-M8	-	-
PIC12C671/2	-	-	DS-M8	-	-
PIC12CE673/4	-	-	DS-M8	-	-
PIC14000	-	-	DS-M8	-	-
PIC16C52/4/5/6/7	-	-	DS-M8	-	-
PIC16C505	-	-	DS-M8	-	-
PIC16C554/6/8	-	-	DS-M8	-	-
PIC16C61/2/3/4/5/6/7/8	-	-	DS-M8	-	-
PIC16C620/1/2	-	-	DS-M8	-	-
PIC16CE623/4/5	-	-	DS-M8	-	-
PIC16C641/2	-	-	DS-M8	-	-
PIC16C661/2	-	-	DS-M8	-	-
PIC16C71/2/3/4/6/7	-	-	DS-M8	-	-
PIC16C710/1/5	-	-	DS-M8	-	-
PIC16C83/4	-	-	DS-M8	-	-

$\mu P/\mu C$	Development Board	Low Cost Emulator	In Circuit Emulator	Programmer	SW
PIC17C42/3/4	-	-	DS-M8	-	-
PIC17C752/6	-	-	DS-M8	-	-
PIC17C762/6	-	-	DS-M8	-	-
PSD3xx	-	-	DS-300	-	-
SAB-C501	-	-	DS-51	MP-51	CA51
SAB-C504	-	-	DS-51	MP-51	CA51
SAB-C505	-	-	DS-51	MP-51	CA51
SAB-C511	-	-	DS-51	MP-51	CA51
SAB-C513	-	-	DS-51	MP-51	CA51
SAB-C515	-	-	DS-51	MP-51	CA51
SAB-C517	-	-	DS-51	MP-51	CA51
V20/V25/30/40/50	-	-	DS-186	-	Paradigm

## LINECARDS

The following lists the supported devices according to the silicon manufacturers and the corresponding Ceibo products. These linecards are continuously updated in [www.ceibo.com](http://www.ceibo.com) with information about availability, accessories of the system, frequency, voltage and many more details. The supported companies are AMD, Atmel, Dallas, Intel, Microchip, NEC, Philips, Siemens, Temic and WSI; others may be added in the future. As these lists are continuously changing, please use the linecards in this catalog just as a general reference and refer to Ceibo's web site for more information; the linecards are accessed in the first page of Ceibo home page just by clicking on the logo of the desired silicon manufacturer.

<b>SILICON MANUFACTURER</b>	<b>COMPONENT</b>	<b>CEIBO PRODUCTS</b>
AMD	80C186/8, 80L186/8	DS-186 EMULATOR
ATMEL/TEMIC	AT89C51, AT89LV51, AT89C52, AT89LV52, AT89S8252, AT89S53, AT89C55, AT89C1051, AT89C2051, AT89C4051	DS-51 EMULATOR, EB-51 LOW COST EMULATOR MP-51 PROGRAMMER CA51 COMPILER
	89C51Rx2	FE-51RD2 EMULATOR MP-51 PROGRAMMER CA51 COMPILER
	89C51CC01	FE-51CC01 EMULATOR MP-51 PROGRAMMER CA51 COMPILER
	TSC8x251G1/2, TSC8x251G1D TSC8x251G1/2, TSC8x251G1D	DS-251 EMULATOR, MP-51 PROGRAMMER, CA251 COMPILER
DALLAS	80C310, 80C320, 80C323	DS-51 EMULATOR, EB-51 LOW COST EMULATOR, CA51 COMPILER
	87C520, 87C530	DS-51 EMULATOR, MP-51 PROGRAMMER, CA51 COMPILER
	89C420	FE-C420 EMULATOR MP-51 PROGRAMMER, CA51 COMPILER



<b>SILICON MANUFACTURER</b>	<b>COMPONENT</b>	<b>CEIBO PRODUCTS</b>
INTEL	8085	DS-85 EMULATOR
	80C31/2, 8xC51/2/4/8, 8xL52/4/8 8xC51FA/B/C, 8xC51RA/B/C	DS-51 EMULATOR, EB-51 LOW COST EMULATOR, MP-51 PROGRAMMER, CA51 COMPILER
	8xC251SA/B/P/Q	DS-251 EMULATOR, EB-C251 LOW COST EMULATOR, MP-51 PROGRAMMER, CA251 COMPILER
	8xC251TA/B/P/Q	DS-251 EMULATOR, EB-C251 LOW COST EMULATOR, CA251 COMPILER
	8086/8, 80C86/8, 80186/8, 80C186/8, 80C186/8XL, 80C186/8EA, 80L186EA, 80C186/8EB, 80C186/8EC	DS-186 EMULATOR
MICROCHIP	PIC12C508/9, PIC12CE518/9, PIC12C671/2, PIC12CE673/4	DS-M8 EMULATOR
	PIC14000	DS-M8 EMULATOR
	PIC16C52/4/5/6/7/8 PIC16C505, PIC16C554/6/8, PIC16C61/2/3/4/5/6/7, PIC16C641/2, PIC16CE623/4/5, PIC16C620/1/2, PIC16C661/2, PIC16C71/2/3/4/6/7, PIC16C710/1/5, PIC16C83/4	DS-M8 EMULATOR
	PIC17C42/3/4, PIC17C762/6	DS-M8 EMULATOR
NEC	V20/25/30/40/50	DS-186 EMULATOR
PHILIPS	80C31/2, 8xC51/2/4/8, 8xL52/4/8	DB-51 DEVELOPMENT BOARD, DS-51 EMULATOR,
	8xC51FA/B/C, 8xL51FA/B/C	EB-51 LOW COST EMULATOR,

<b>SILICON MANUFACTURER</b>	<b>COMPONENT</b>	<b>CEIBO PRODUCTS</b>
PHILIPS	8xC51RA/B/C/D+,8xC504/8, 8xC524/8, 89C536/8, 8xC550, 8xC552/4, 8xC562, 8xC652/4	MP-51 PROGRAMMER, CA51 COMPILER
	8xCL134/434/834, 8xCE558/9, 8xC575, 8xC592, 8xCE598,	DS-51 EMULATOR,
	8xC054/5 8xCL167/8, 8xCL267/8,	MP-51 PROGRAMMER,
	8xCL580, 8xCL781/2	CA51 COMPILER DS-51 EMULATOR, CA51 COMPILER
	8xC748/9, 8xC750/1/2	DS-750 EMULATOR, DS-51 EMULATOR, MP-51 PROGRAMMER, CA51 COMPILER
	8xCE560,8xC576,8xCL766, 8xCL770, 8xCL880/1/3/4/6/7/8, PCA5007,PCA5010, PCA5097,PCD509x7, PCD6002	MP-51 PROGRAMMER,
	8xC764	EB-76X LOW COST EMULATOR, DS-51 EMULATOR, MP-51 PROGRAMMER, CA51 COMPILER
	P51XAG1/2/3x	EB-XA LOW COST EMULATOR, DS-XA EMULATOR, MP-51 PROGRAMMER, C-XA COMPILER
	P51XAS3x	EB-XA LOW COST EMULATOR, DS-XA EMULATOR, MP-51 PROGRAMMER, C-XA COMPILER
	P51XAG49	DS-XA EMULATOR, MP-51 PROGRAMMER, C-XA COMPILER
	P51XAC3	DS-XA EMULATOR, MP-51 PROGRAMMER, C-XA COMPILER

<b>SILICON MANUFACTURER</b>	<b>COMPONENT</b>	<b>CEIBO PRODUCTS</b>
PHILIPS	PCD3315A, PCD3343A, PCD3344A, PCD3348A, PCD3349A, PCD3350A, PCD3351A, PCD3352A, PCD3353A, PCD3354A, PCF84C00, PCF84C21A, PCF84C41A, PCF84C81A	DS-48 EMULATOR
	..... PCD3745A, PCD3755A, PCD3756A	DS-48 EMULATOR, MP-51 PROGRAMMER
INFINEON	SAB-C501, SAB-C513 SAB-C504, SAB-C505, SAB-C515, SAB-C517, 80C512/532, 80C515/535A, 80C517/537A	DS-51 EMULATOR, MP-51 PROGRAMMER, CA51 COMPILER
WSI	PSD3xx	DS-300 EMULATOR, PSDMAP SOFTWARE

## PRODUCT COMPARISONS

As low-cost emulation boards and complete in-circuit emulators are sometimes close in features and more information is needed to select the right product, following is general information about the major differences of Ceibo's most popular products.

### 8051 Emulators: EB-51 and DS-51

### MCS251 Emulators: EB-C251 and DS-251

### 80C51XA Emulators: EB-XA and DS-XA

## EB-51 AND DS-51 DIFFERENCES

EB-51 is a system with less features than DS-51. EB-51 supports 40-pin DIP and 44-pin PLCC 8051 derivatives from Philips and Intel, Dallas 80C310/320/323, Philips 80C552, Atmel 89C51/2/5 and 89C1051/2051/4051, and other compatible derivatives at 3V or 5V. DS-51 support all 8051 derivatives from 1.5V to 6V. EB-51 does not have real-time trace memory and sophisticated hardware breakpoints like the DS-51. EB-51 has only software breakpoints, meaning that code is replaced by a break instruction, and therefore it can only be applied to the code mapped into the emulator memory. DS-51 has hardware breakpoints, that can be applied to target memory space as well, so if you have your program on an EPROM inside your target board, you may need the hardware breakpoints. The DS-51 real-time trace can be read "on the fly" and has testpoint clips to record any external signals as if you have a logic analyzer. These clips can be used also to start and stop the trace recording and generate breakpoints.

FEATURES	EB-51	EB-51X2	DS-51
Frequency of Operation	42 MHz	42 MHz	42MHz
Emulation Memory	64K Internal Code Memory	64K Internal Code Memory	Up to 512K internal memory with bank switching
Mapping Resolution	None	None	4K, 8K, 16K, 32K & 64K boundaries
Banking	Not Available	Not Available	Possible (factory setup and up to 512K)
Breakpoints	64K Software Breakpoints	64K Software Breakpoints	512K Hardware Breakpoints
Break on Opcode Execution	Yes	Yes	Yes
Break on Data Read/Write	No	No	Yes
Break on On-Chip Memory, Ports and Register Contents.	No	No	Yes
Break on External Signals	No	No	AND/OR combination of 2 external signals
Break on High Level Lines	Yes	Yes	Yes
Source Level Debugging C, PLM and Assembler	Yes	Yes	Yes
Trace	No	Yes	32K - displays address, status, trace clips and time stamps
Simulation Debug Mode	Yes	Yes	Yes
Performance Analyzer	No	No	Yes
Leds and Switches for Experiments	Yes	Yes	No

## EB-C251 AND DS-251 DIFFERENCES

EB-C251 is a system with less features than DS-251 and it supports only the currently available MCS251 derivatives. Intel and Temic will release in the future other derivatives and they may not be supported by EB-C251 if the emulation chip and pinouts are different than the version available now. DS-251 is prepared for future derivatives with the replacement of a personality probe. EB-C251 may be used for projects up to 64K. The trace and breakpoints are less sophisticated than in DS-251. EB-C251 has only software breakpoints, meaning that code is replaced by a break instruction, and therefore it can only be applied to the code mapped into the emulator memory. DS-251 has hardware breakpoints, that can be applied to target memory space as well, so if you have your program on an EPROM inside your target board, you may need the hardware breakpoints. The DS-251 has testpoint clips that can be connected to any external signals to be recorded in the trace memory as if you have a logic analyzer. These clips can be used also to start and stop the trace recording and generate breakpoints.

FEATURES	EB-C251	DS-251
Frequency of Operation	24MHz or more	24MHz or more
Emulation Memory	64K Internal Memory	256K internal memory
Mapping Resolution	4K, 8K, 16K, 32K & 64K Boundaries	1 Byte
Banking	Not available	Possible (factory setup)
Breakpoints	64K Software Breakpoints	256K Hardware Breakpoints
Break on Opcode Execution	Yes	Yes
Break on Data Read/Write	No	Yes
Break on On-Chip Memory, Ports and Register Contents.	No	Yes
Break on External Signals	No	AND/OR combination of 2 external signals
Break on High Level Lines	Yes	Yes
Source Level Debugging C, PLM and Assembler	Yes	Yes
Trace	2Kx48 bit records: address, data,	32Kx128 bit records: address, data, status status, program counter, trace clips and time stamps
Simulation debug mode	Yes	Yes
Performance Analyzer	Yes	Yes
LEDs and Switches for experiments	Yes	No

## EB-XA AND DS-XA DIFFERENCES

EB-XA is a system with less features than DS-XA. EB-XA does not have real-time trace memory and sophisticated hardware breakpoints like the DS-XA. EB-XA has only software breakpoints, meaning that code is replaced by a break instruction, and therefore it can only be applied to the code mapped into the emulator memory. EB-XA memory is limited to 64K for emulation. DS-XA has hardware breakpoints, that can be applied to target memory space as well, so if you have your program on an EPROM inside your target board, you may need the hardware breakpoints. The DS-XA real-time trace can be read "on the fly" and has testpoint clips to record any external signals as if you have a logic analyzer. These clips can be used also to start and stop the trace recording and generate breakpoints.

<b>FEATURES</b>	<b>EB-XA</b>	<b>EB-XAV2</b>	<b>DS-XA</b>
Frequency of Operation	30 MHz	30 MHz	30 MHz
Emulation Memory	64K	512K	2M
Mapping Resolution	4K, 8K, 16K, 32K &64K	32K Blocks	2K Blocks
Breakpoints	64K	512K	2M
Break on High Level Lines	Yes	Yes	Yes
Source Level Debugging C and Assembler	Yes	Yes	Yes
Trace	No	Yes	Yes
Simulation Debug Mode	Yes	Yes	Yes
Leds and Switches for Experiments	Yes	Yes	No