

## ***DS-XA In-Circuit Emulator***



*In-Circuit Emulator for Philips XA Microcontrollers*

### **FEATURES**

- **Emulates XA Derivatives**
- **2MByte Code and Data Memory**
- **Memory With Mapping Capabilities**
- **Real-Time Trace**
- **Frequency Range up to 30MHz @ 5V**
- **Source-Level Debugger For C And Assembler**
- **MS-Windows Debugger Software for Windows NT and 95 or Later**
- **3.3V And 5V Emulation Support**
- **Support for ROMless and ROM Microcontrollers**
- **PLCC Emulation headers**

## **DESCRIPTION**

Ceibo DS-XA is a development tool that supports Philips XA microcontrollers at any frequency allowed by the devices. It is serially linked to a PC or compatible systems and can emulate the microcontrollers using either the built-in clock generator or any other clock source connected to the microcontroller. Emulation is carried out by loading the system with the user software. As the system uses Philips bond-out technology, emulation is carried out transparently and in real-time without affecting port or register states. Breakpoints can be added to stop program execution at a specific address.

The emulator provides an easy way to debug hardware and software functions. The software includes C and Assembler Source Level Debugger, On-line Assembler and Disassembler, Trace, Conditional Breakpoints and many other features. The system is supplied with Windows debugger software, RS-232 cable and a power supply.

## **SPECIFICATIONS**

### **SYSTEM MEMORY**

DS-XA provides 2MByte of user code/data memory. This RAM memory permits downloading and modifying of user's programs and variables. Code /data memory is mapped as belonging to DS-XA or to the target system. The emulator also includes 64 KBytes of RAM to be used as code memory of on-chip ROM/Flash/EPROM emulation. The system is provided with a total of 2MByte of memory that can be mapped in 32K blocks.

### **BREAKPOINTS**

Breakpoints allow real-time program execution until an opcode is executed at a specified address.

### **WINDOWS DEBUGGER**

The DS-XA software includes a source level debugger for Assembler and high-level languages C and others) with the capability of executing lines of the program while displaying the state of any variable. The debugger uses symbols contained in the absolute file generated by the most commonly used Assemblers and High Level Language Compilers. The CEIBO Windows Debugger runs only under Windows 95 or later and also under Windows NT.

### **REAL-TIME TRACE**

The trace concept has changed and improved. Now the trace depth is variable to optimise it and in many cases is like endless.

The XA bondout chip has special signals to recreate the internal program counter. The new implementation of the real-time trace records up to 32K frames with the recreated program counter "changes" due to non-sequential instructions (call, jump, interrupt, etc.) Only the changes are recorded in the trace. The software completes the executed instructions between non-sequential instructions, so the trace depth is variable and according to this definition. This allows a high performance usage of the trace memory.

This does not mean that the trace is 32K as an average of code execution it is many millions of frames.

### **SUPPORTED MICROCONTROLLERS**

The supported microcontrollers are most of the Philips XA microcontrollers in both ROMless and ROMed versions. DS-XA has personality probes to emulate different microcontrollers. Currently the supported derivatives are G3, C3, C49 and S3.

### **MICROCONTROLLER SELECTION**

DS-XA uses bond-out Philips microcontrollers for hardware and software emulation. The selection of a different microcontroller derivative is made by software setup replacing the personality probe. DS-XA runs at the frequency setup of the system or from the clock source supplied by the user hardware. The minimum and maximum frequencies are determined by the emulated chip characteristics, while the emulator maximum frequency is 30MHz.

### **HOST CHARACTERISTICS**

PC or compatible systems with 4 MByte of RAM, one RS-232C interface card for the PC, Windows 95 or later.

### **INPUT POWER**

5V, 4A power supply supplied.

### **MECHANICAL DIMENSIONS**

10cm x 10cm.

### **ITEMS SUPPLIED AS STANDARD**

Emulator with 2MByte Memory, Windows software including source level debugger, on-line assembler and disassembler, user's manual, RS-232 cable and power supply.

### **OPTIONS**

Personality probes and emulation headers for the different microcontrollers.

### **PERSONALITY PROBES**

Probe G3 is used to emulate all the XA-G3 microcontroller derivatives with 44-PLCC package. Probe G49 is similar to it but with a different bond-out chip installed on the board. Probe C3 has a different PCB layout and bondout chip and it is used to emulate the XA-C3 derivatives. Probe S3 emulates the XA-S3 derivatives with 68-PLCC package. Ceibo also has emulation adapters for other packages support.

## FREQUENCY

Frequency is programmable from 400KHz to 40MHz in steps of 2KHz from the Options/Xtal Menu and the emulator uses as special clock source controlled by software for this purpose.

## EMULATION HEADER

Different emulation headers are available to support microcontrollers in the following packages: 40-DIP, 44-PLCC, 44-QFP, 68-PLCC, 80-QFP and others. Consult [www.ceibo.com](http://www.ceibo.com) for the latest list of supported packages and devices.

## EMULATION SUPPORT

The list of emulation support for standard DS-XA systems is as follows:

<i>Microcontroller</i>	<i>Personality Probes</i>	<i>Header</i>	<i>Special Adapter</i>	<i>fmax</i>	<i>Voltage</i>
XA-G3x	Probe G3	44-PLCC	40-DIP, 44-QFP	20/30 MHz	3.3/5V
XA-C3x	Probe C3	44-PLCC	40-DIP, 44-QFP	20/30 MHz	3.3/5V
XA-G49	Probe G49	44-PLCC	40-DIP, 44-QFP	20/30 MHz	3.3/5V
XA-S3x	Probe S3	68-PLCC	80-QFP	20/30 MHz	3.3/5V

*Supported Microcontrollers*

As the list of supported devices and available personality probes is continuously evolving, call Ceibo to receive the latest update.

## EMULATION RESTRICTIONS

The following restrictions are valid for DS-XA:

1. DS-XA Monitor Program shares 32 bytes of the memory. The options menu allow to define this reserved memory at any address of the 64K available for the code memory. For example, if the 32K boundary is selected, addresses 7FE0h to 7FFFh may be reserved by the system.
2. The program also uses 6 Bytes of the system stack memory.
3. WAIT input must not stuck to an active level if enabled by software. Otherwise the emulator will generate an error message.
4. Breakpoint Vector - DS-XA uses this vector to set software breakpoints. The breakpoint addresses are reserved by DS-XA.

## **DS-XA - ORDERING INFORMATION**

<b><i>Item</i></b>	<b><i>Description</i></b>
DS-XA	Emulator, Software, Power Supply, Cables.
Probe G3	Personality Probe, 44-pin PLCC Emulation Header
Probe G49	Personality Probe, 44-pin PLCC Emulation Header
Probe S3	Personality Probe, 68-pin PLCC Emulation Header
Probe C3	Personality Probe, 44-pin PLCC Emulation Header