

inDART-One Quickstart Tutorial

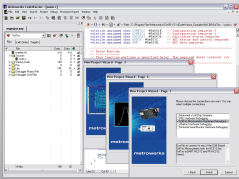


CodeWarrior™

The inDART-One In-Circuit Programmer/Debugger comes with CodeWarrior™ Development Studio Special Editions for the various Freescale 8- and 16-bit families.

CodeWarrior Development Studio offers the following features:

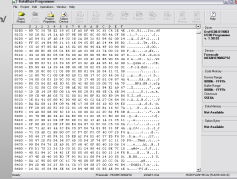
- Editor;
- Assembler;
- Code-size limited C compiler;
- Linker;
- Debugger;
- Full-chip simulation;
- Processor Expert.



DataBlaze

DataBlaze is a full-feature programming utility suitable for development environment. DataBlaze offers the following advanced features:

- Memory editing;
- Blank check/erase/program/verify/read operations/oscillator trimming operations;
- Project handling;
- One-button, multiple-operations programming ("Auto" feature).



MultiBlaze

MultiBlaze is an easy-to-use multiple programming utility suitable for production environment. MultiBlaze offers the following features:

- Up to 32 inDART-One instruments simultaneously controllable from the same PC;
- Easy-to-use programming interface;
- Blank check/erase/program/verify/read operations;
- One-button, multiple-operations programming ("Auto" feature);
- Operator and Supervisor mode (password protected);
- Statistics and logging.



HC08 Fast Programming Algorithms

Fast programming algorithms significantly reduce the amount of time needed to program HC08 devices. Fast programming algorithms can be used both in single and multiple programming.

Device	Condition	Operation/Time
MC68HC908AZ0A	60KHz, RCPU = 4MHz	Program = 2.7s, Program/Verify = 5.4s
MC68HC908P12	320KHz, RCPU = 4MHz	Program = 1.5s, Program/Verify = 2.9s
MC68HC908D8	80KHz, RCPU = 4MHz	Program = 1.1s, Program/Trimming/Verify = 1.5s



LEDs USB Connector Push Button

IPL Programming Library

The IPL-ONE programming library is a DLL which includes all of the low-level functions that allow you to set up the instrument and perform all of the programming commands and functions of the DataBlaze and MultiBlaze programming utilities from within your own Windows application.

The IPL-ONE programming library contains C written routines, and can be used to interface the instrument from within, for example, a Microsoft Visual C or Visual Basic application, as well as any other programming language that supports the DLL mechanism.



HC08 Target Powering

When working with HC08 devices, the two "TARGET POWER" connectors can be used to automatically or manually power the target board on and off as required in order to enter the monitor mode.

Additionally, two configurations are possible: in the first configuration, the "TARGET POWER IN" connector is routed to the target board via the "TARGET POWER OUT" connector, through an internal relay driven by inDART-One.

In the second configuration, the voltage at the "TARGET POWER OUT" connector is internally generated by inDART-One, and the "TARGET POWER IN" connector is not used.

Please refer to the user's manual for detailed information.



Power Connectors MON08 Connector BDM Connector

BDM Connector

inDART-One uses the standard, 6-pin BDM connector defined by Freescale to program and debug HC08, HC12 and HC12X devices. You must therefore provide such connector (see the diagram below) on your target board.



Pin	Signal Name	Description
1	BKGD	Single-wire background interface pin.
2	GND	System ground.
3	NC	Not connected.
4	RST/WPP	Reset signal to target system, or V _{cc} .
5	NC	Not connected.
6	VDD	Power supply voltage from target. This pin is used by inDART-One for signal conditioning.

MON08 Connector

inDART-One uses a 16-pin MON08 connector to program and debug HC08 devices. This connector can be configured to work as a standard (PSE compatible) MON08 connector or as an enhanced (SoftTec Microsystems compatible) MON08 connector. The enhanced MON08 connector allows the target microcontroller to free some lines after entering the monitor mode at reset.

For more information about how to provide the appropriate MON08 connector in your target board, see "MON08 Target Connections" in the user's manual.



Pin	Signal Name	Description
2	GND	System ground.
4	RST#	MCU reset, held at V _{cc} (or V _{ee} , depending on the target microcontroller) out of reset. No other target-system logic should be tied to this signal.
6	IRQ#	MCU interrupt, held at V _{cc} .
8, 10, 12, 14, 16	MON4...MON8	I/O pins connected to target microcontroller.
13	OSC	This signal can be used as an auxiliary clock source, and is particularly useful when the target microcontroller requires an external clock which is not available on the target board.
15	VDD	The target V _{cc} line needs to be driven correctly at reset. When using the MON08 connector in standard mode, inDART-One can automatically supply the signal.
1, 3, 5, 7, 9, 11	NC	Not connected.



Pin	Signal Name	Description
1	RST_OUT#	Reset signal to target system: GND or open drain output reflecting the state of the MCU RST# and RST_IN# signals.
2	GND	System ground.
3	RST_IN#	Reset signal from target system: GND to V _{cc} input to control the state of the MCU RST# and RST_OUT# signals.
4	RST#	MCU reset, held at V _{cc} (or V _{ee} , depending on the target microcontroller) out of reset. No other target-system logic should be tied to this signal.
5	TGT_IRQ#	Interrupt signal from target system: GND to V _{cc} input to control the state of the MCU IRQ# signal.
6	IRQ#	MCU interrupt, held at V _{cc} when the TGT_IRQ# signal is not asserted.
7, 9, 11, 13, 15	TGT_MON4...TGT_MON8	I/O pins connected to target application.
8, 10, 12, 14, 16	MON4...MON8	I/O pins connected to target microcontroller.



Development Tools
for the Embedded World

Microcontroller Development Tools
www.softecmicro.com

inDART-One Quickstart Tutorial



1 Install CodeWarrior Development Studio

inDART-One takes advantage of the CodeWarrior™ Development Studio Special Edition (which groups an Editor, Assembler, C Compiler and Debugger) and the Freescale MON08 and BDM interfaces, which allow the download and debug of the user application into the target microcontroller's FLASH memory.

Together with CodeWarrior, inDART-One provides you with everything you need to write, compile, download, in-circuit emulate and debug user code. Full-speed program execution allows you to perform hardware and software testing in real-time. inDART-One is connected to the host PC through a USB port.

To install the CodeWarrior Development Studio Special Edition, insert the correct CodeWarrior CD-ROM (the one supporting the device family you will work with) into your computer's CD-ROM drive. A startup window will automatically appear. Follow the on-screen instructions.



2 Install inDART-One Utilities

The inDART-One utilities setup installs all of the other required components to your hard drive. These components include the inDART-One USB driver and DLLs, DataBlaze programming utility, MultiBlaze multiple programming utility, inDART-One control panel, inDART Programming Library examples and documentation in PDF format.

To install the inDART-One utilities, insert the SofTec Microsystems™ System Software™ CD-ROM into your computer's CD-ROM drive. A startup window will automatically appear.

Choose "Install Instrument Software" from the main menu. A list of available software will appear. Click on the "inDART-One Utilities" option. Follow the on-screen instructions.

Note: to install the inDART-One utilities on Windows 2000 or Windows XP, you must log in as Administrator.



3 Connect the instrument to the PC

Connect inDART-One to a free USB port on your PC. When connecting more than one inDART-One to a host PC, USB hubs can be used.

inDART-One is USB 2.0 compliant and uses a high speed connection, but can be connected to USB 1.1 systems as well.

inDART-One is powered by the USB bus voltage, and requires a USB port capable of supplying 350 mA.

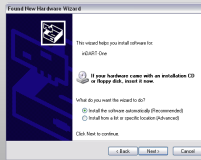


4 Found New Hardware Wizard

The first time inDART-One is connected to the PC, Windows recognizes the instrument and starts the "Found New Hardware Wizard" procedure, asking you to specify the driver to use for the instrument.

The procedure is slightly different on each version of Windows. On Windows XP select the "Install the software automatically" option and click on the "Next" button.

Be sure not to specify any drive or optional location where to look for the driver, since it has already been installed on your hard disk by the inDART-One utilities setup.



Note: both Windows 2000 and Windows XP may issue a warning during the "Found New Hardware Wizard" procedure. This warning is related to the fact that the USB driver used by inDART-One is not digitally signed by Microsoft, and Windows considers it to be potentially malfunctioning or dangerous for the system. However, you can safely ignore the warning, since every kind of compatibility/security test has been carried out by SofTec Microsystems.



5 Connect inDART-One to your target board

inDART-One connects to your target board either via the MON08 connector or the BDM connector, depending on your hardware's target device. Additionally, you can take advantage of the Target Power connectors to supply your target board.

After physically connecting inDART-One to your target hardware, inDART-One must be configured properly so that communication with the target device can be established correctly.

Communication settings are defined through the "Communication Settings" dialog box, available both in CodeWarrior and in the DataBlaze and MultiBlaze programming utilities.

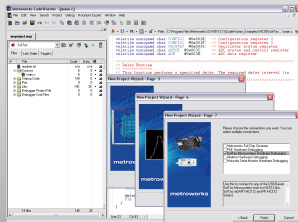
Each target device/hardware configuration requires specific settings, detailed in the user's manual.



6 Debug with CodeWarrior

Start CodeWarrior™ Development Studio by selecting "Start > Programs > SofTec Microsystems > inDART-One > CodeWarrior Development Studio".

CodeWarrior helps you get started with your own application by including a project wizard specific for inDART-One. To create a new project, select "File > New..." from the main menu and follow the wizard instructions.

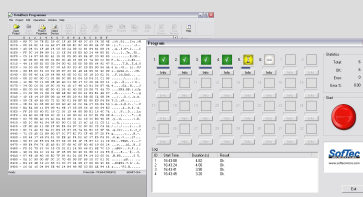


7 Program with DataBlaze or MultiBlaze

Two programming utilities are provided. DataBlaze can be used for single programming (suitable for the development environment), while MultiBlaze can be used for multiple programming (suitable for the production environment).

To start the DataBlaze utility select "Start > Programs > SofTec Microsystems > inDART-One > DataBlaze Programmer".

To start the MultiBlaze gang programming utility select "Start > Programs > SofTec Microsystems > inDART-One > MultiBlaze Programmer".



8 Congratulations!

You have successfully completed this tutorial!

For detailed information on using inDART-One and its software utilities, please carefully read the user's manual.



For the latest software releases, new products, new supported devices, discussion forums and FAQs, log on to

<http://www.softecmicro.com/>



Development Tools
for the Embedded World

Microcontroller Development Tools
www.softecmicro.com