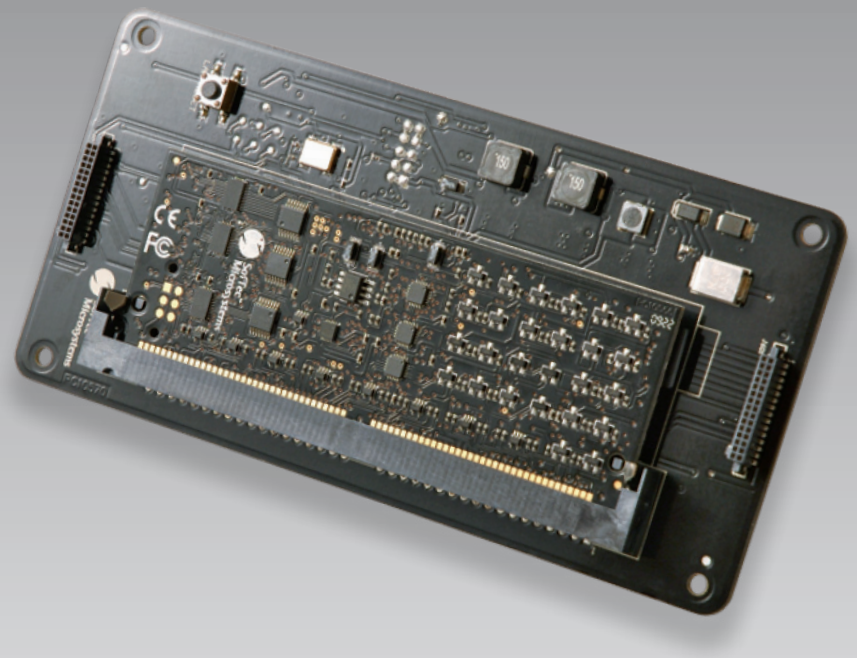
FLASHRUNNER

High-Performance, Standalone In-System Programmer

FR3070A

User's Manual



SMH Technologies™

FR 3070 A

Plug -in Card
for Agilent Medalist
i3070 Utility Card

User's Manual

Revision 1.2

DC 10734

We want your feedback!

SMH Technologies is always on the lookout for new ways to improve its Products and Services. For this reason feedback, comments, suggestions or criticisms, however small, are always welcome.

Our policy at SMH Technologies is to comply with all applicable worldwide safety and EMC/EMI regulations. Our products are certified to comply with the European New Approach Directives and the CE mark is applied on all our products.

This product as shipped from the factory has been verified to meet with requirements FCC as a CLASS A product.

In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate prevention measures.

Attaching additional wiring to this product or modifying the product operation from the factory default as shipped may effect its performance and cause interference with other apparatus in the immediate vicinity. If such interference is detected, suitable mitigating measures should be taken.

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0 Before Starting

Note: *the SMH Technologies website (www.smh-tech.com) may contain an updated version of this user's manual. Please check before continuing reading this documentation.*

0.1 Important Notice to Users

While every effort has been made to ensure the accuracy of all information in this document, SMH Technologies assumes no liability to any party for any loss or damage caused by errors or omissions or by statements of any kind in this document, its updates, supplements, or special editions, whether such errors are omissions or statements resulting from negligence, accidents, or any other cause.

0.2 Safety

To protect FR3070A against electrostatic discharge (ESD), always connect yourself to ground (e.g. via wrist straps) when handling the board.

Always store FR3070A inside an antistatic bag when not in use.

0.3 Getting Technical Support

SMH Technologies is continuously working to improve the firmware and to release programming algorithms for new devices. SMH Technologies offers a fast and knowledgeable technical support to all of its customers and is always available to solve specific problems or meet specific needs.

To get in touch with SMH Technologies, please refer to the contact information below.

Phone: +39 0434 421111

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Technical Support: *support@smh-tech.com*

0.4 Additional Documentation

This user's manual provides information about how to setup FR3070A and its hardware characteristics.

For information about FlashRunner commands and their syntax, including specific commands for specific family of microcontrollers, please refer to the FlashRunner Programmer's Manual, included (in PDF format) in the FlashRunner CD-ROM, or download the latest version on SMH Technologies website (www.smh-tech.com) in the download area.

1 Overview

1.1 What is FR3070A?

FR3070A is an optional daughter board that can be mounted on Agilent Medalist In-circuit Board Test System Utility Card.

- With the Agilent Medalist In-Circuit Board Test System Utility Card, the integration of implementation of the general MCUs, Flash and EEPROM programming or any other functional testing can be easily achieved
- multiples of plug-in cards support
- Dedicated 12 signal pins to DUT - (no MUX)

It provides plug-in slots for common programming protocols for MCUs, Flash and EEPROM used in Automotive and other electronic industries.

The plug-in card should come with the necessary software and drivers that can be integrated into the Agilent Medalist Window XP environment to improve the user experience in developing and debugging production tests.

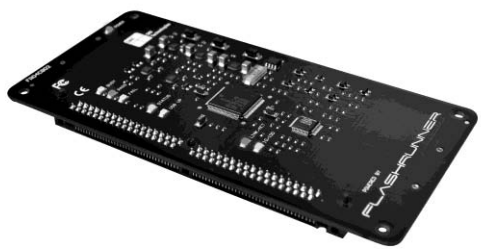


Figure 1.1: FR 3070 A

1.2 Features

1.2.1 General features

- Fastest programming algorithms (as fast as target device's memory technology limit), approved by silicon manufacturers;
- Supports most ISP protocols (BDM, JTAG, SPI, I2C, MON, ICC, SCI, etc.);
- Data integrity guaranteed (every data transfer to/from the host system or Secure Digital card is CRC tagged).

1.2.2 Hardware

- 12V power supply input;
- ISP lines:
  Six digital I/O lines;
  Two digital I/O or analog output lines;
  Two programmable output voltages;
- One programmable clock output
- Secure Digital memory cards (up to 2 GB);
- 512 bytes on-board dynamic memory;
- No magnetic isolated Ethernet channels.
- Clear and card reset input lines

1.2.3 Software

- Controllable by any Windows based system through specific DLL
- unlimited software-selectable scripts projects
- Interface Library DLL to control the instrument from within user written applications
- Erase, blank check, program, read, verify, oscillator trimming, etc.

1.3 Package Checklist

The FR3070A package includes the following items:

- FR3070A unit including pre-installed uSD cards with the programming algorithm(s) specified at the time of purchase

- User's manual
- Registration card

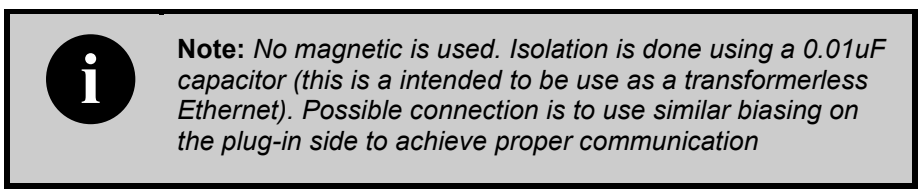
1.4 Hardware Overview

FR3070A is composed of one board assembly witch can be connected through a 2 X 28 pins connectors to the Agilent Medalist In-circuit Board Utility card

1.4.1 Power Supply

FR3070A is powered through a 12V DC power supply.

1.4.2 LAN Connection



1.4.3 ISP lines

12 specific fully configurable lines are available.

1.5 Programming Algorithms and Licenses

FR3070A includes programming algorithms for several devices. In order to program a specific device, however, a specific license file for that device must be purchased.

Note: *FR3070A comes already preinstalled with the license(s) you specified at the moment of purchase. You can purchase additional licenses at any future moment.*

Programming algorithms and license files are stored in the SD card (see the FlashRunner Programmer's Manual for more information).

1.5.1 Installing New Licenses

When you buy an additional license for a specific device, you will get:

- An algorithm file (.alg);
- A license file (.lic);
- A device-specific script example (.frs).

The .alg file contains the actual programming algorithm for the requested device (and several other devices of the same family).

The .lic file contains an unlocking code that will let you use the programming algorithm. A license file enables the use of a specific programming algorithm on a specific FR3070A instrument (licenses are serial number specific).

The script file contains an example of script to use as a starting point for your specific programming needs (for more information on scripts, see the FlashRunner Programmer's Manual).

To install the new license, do the following (for each programming module):

1. Copy the **`.alg`** file into the **`\ALGOS`** directory of the SD card (if an .alg file with the same name already exists, overwrite it);
2. Copy the **`.lic`** file into the **`\LICENSES`** directory of the SD card.

To copy files on the SD card, use either a standard card reader connected to a PC or transfer the files using the FlashRunner **`FSSENDFILE`** command (for more information on FR3070A commands, see the FlashRunner Programmer's Manual).

1.6 Upgrading the Firmware

The FR3070A firmware can be easily upgraded, for more information, please refer to the FlashRunner Programmer's Manual.

2 System Setup

2.1 Overview

This chapter will explain how to set up FR3070A for the first time.

Note: to install the FR3070A hardware please refer to the Agilent Medalist In-circuit Board Utility card technical specifications

2.2 Software Setup

The FR3070A system software CD contains the following components:

- DLL files
- Script examples
- Documentation in PDF format

2.2.1 DLL installation

See Agilent Medalist In-circuit Board Utility card technical specifications

2.3 Programming example

Here below a typical example of FR3070A software interfacing:

```
xdload "FR3070A1"
xdconnect "FR3070A1"

xdcall "FR3070A1","send_command",Var,Rtn$; "run SCRIPT.FRS"
xdcall "FR3070A1","get_answer",Var,Rtn$; "20000"

if Rtn$ = ">" then
print "Programming Passed"
else
print "Programming Failed, The error code is "; Rtn$
end if

xddisconnect "FR3070A1"
xdunload "FR3070A1"
```

2.4 LAN Configuration

FlashRunner Programmer's Manual describes the proper procedure for modifying LAN parameters.

FR3070A is shipped with following factory parameters:
IP address: 10.3.112.20
Subnet id: 255.0.0.0
Gateway: 10.3.112.2

If Ethernet module is reset, factory parameters will not be loaded. New parameters are the following ones:

IP address: 192.168.1.100

Subnet id: 255.255.255.0

Gateway: 192.168.1.1

3 Connectors

3.1 Overview

FR3070A must be connected to the Agilent Medalist In-circuit Board utility card by using 2 high-density connectors.

3.2 ISP connector

All the ISP line are connected trough the J601 connector (see figure below). This connector has several input/output lines (both digital and analog) that are automatically configured depending on the specific target device to be programmed (see the Programmer's Manual to learn how to connect these lines to your specific target device).

Note: *ISP and I/O signals are not optoisolated and are referenced to GND (the power supply ground).*

3.3 ISP and Communication connectors

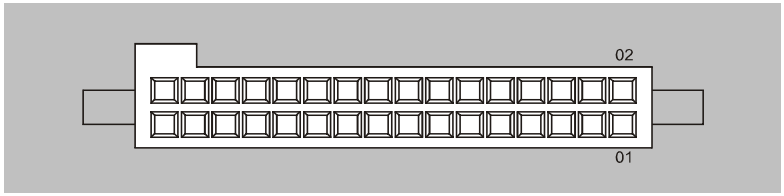


Figure 3.1: "J601" and "J602" connectors (top wiew)

Table 3.1: "J601" Connector Signals

Pin #	Signal Name	Description
A1	N.C.	Not Connected
A2	DIO0/AO0	Digital input/output 0 or analog output 0
A3	N.C.	Not Connected
A4	DIO1/AO1	Digital input/output 1 or analog output 1
A5	N.C.	Not Connected
A6	DIO2	Digital input/output 2
A7	N.C.	Not Connected
A8	DIO3	Digital input/output 3
A9	GND	Ground
A10	DIO4	Digital input/output 4
A11	N.C.	Not Connected
A12	DIO5	Digital input/output 5
A13	N.C.	Not Connected
A14	DIO6	Digital input/output 6
A15	N.C.	Not Connected
A16	GND	Ground
A17	N.C.	Not Connected
A18	CLKOUT	Clock output
A19	N.C.	Not Connected
A20	GND	Ground
A21	N.C.	Not Connected
A22	VPROG0	Programmable voltage 0
A23	GND	Ground
A24	VPROG1	Programmable voltage 1
A25	GND	Ground
A26	AIN0	Analog Input Line 0
A27	12Vdc	DC power supply
A28	N.C.	Not Connected

Pin #	Signal Name	Description
A29	12Vdc	DC power supply
A30	N.C.	Not Connected

Table 3.2: “J602” Connector Signals

Pin #	Signal Name	Description
A1	N.C.	Not Connected
A2	Reserved	Reserved
A3	N.C.	Not Connected
A4	GND	Ground
A5	N.C.	Not Connected
A6	Reserved	Reserved
A7	N.C.	Not Connected
A8	Reserved	Reserved
A9	AGND	Analog Gound
A10	ETH_TXP	ethernet TX+
A11	N.C.	Not Connected
A12	N.C.	Not Connected
A13	ETH_TXN	ethernet TX-
A14	N.C.	Not Connected
A15	AGND	Analog Gound
A16	AGND	Analog Gound
A17	N.C.	Not Connected
A18	N.C.	Not Connected
A19	ETH_RXP	ethernet RX+
A20	N.C.	Not Connected
A21	ETH_RXN	ethernet RX-
A22	N.C.	Not Connected
A23	AGND	Analog Gound
A24	N.C.	Not Connected
A25	GND	Ground
A26	N.C.	Not Connected
A27	N.C.	Not Connected
A28	UNIV_CLEAR#	Universal Clear
A29	N.C.	Not Connected
A30	CARD_RESET#	Plug-in Card Reset
	N.C.	Not Connected

4 Technical Specifications

4.1 Absolute Maximum Ratings

Table 4.1: Absolute Maximum Ratings

Parameter	Value
"J601" power	
Maximum supply voltage on line POWER (reference GND)	-20V to 15V
"J601" ISP lines	
Maximum input voltage on lines DIO/AO[1..0], DIO[6..2], CLKOUT	-1V to +7V
Maximum current on lines DIO/AO[1..0], DIO[6..2], CLKOUT	±50mA
Maximum current on line VPROG0	500mA
Maximum current on line VPROG1	250mA
"J602" communication lines	
Maximum input voltage on lines UNIV_CLEAR#, CARD_RESET#	-1V to +7V

4.2 DC Characteristics and Functional Operating Range

Table 4.2: DC Characteristics and Functional Operating Range

"J601" Connector				
V_{IL} (input low voltage) on lines DIO	Configured as digital lines	-	-	$0.3V_{PROG0}$
V_{IH} (input high voltage) on lines DIO	Configured as digital lines	$0.7V_{PROG0}$	-	V_{PROG0}
V_{OL} (output low voltage) on lines DIO, CLKOUT	Configured as digital lines, V_{PROG0} = 3V, I_{OL} = 12mA	-	-	0.36V
V_{OH} (output high voltage) on lines DIO, CLKOUT	Configured as digital lines, V_{PROG0} = 3V, I_{OH} = 12mA	2.56V	-	-
V_{OL} (output low voltage) on lines DIO, CLKOUT	Configured as digital lines, V_{PROG0} = 5.5V, I_{OL} = 24mA	-	-	0.36V
V_{OH} (output high voltage) on lines DIO, CLKOUT	Configured as digital lines, V_{PROG0} = 5.5V, I_{OH} = 24mA	4.86V	-	-
I_{OH} current (source) on lines DIO	Configured as input with active pull-ups	-	3.4mA	-

DIO/AO[1..0] voltage	Configured as analog output	0V	-	14.5V
DIO/AO[1..0] IO current (sink and source)	Configured as analog output	-	-	±40mA
I_{OH} current (source) on lines DIO/AO[1..0]	Configured as analog lines with active pull-ups	-	5.5mA	-
VPROG0 output voltage		1.6V	-	5.5V
VPROG0 current (source)		-	-	500mA
VPROG1 output voltage		3.5V	-	13V
VPROG1 current (source)		-	-	250mA
Supply voltage		-	12V	-
Power consumption		-	-	1.5A

"J602" Connector				
V_{IL} (input low voltage) on lines UNIV_CLEAR#, CARD_RESET#		-	-	0.99
V_{IH} (input high voltage) on lines UNIV_CLEAR#, CARD_RESET#		2.30	-	3.6

4.3 AC Characteristics

Table 4.3: AC Characteristics

Parameter	Condition		Value		
			Min	Typ	Max
t_{RISE} on lines DIO[6..2], DIO[1..0], CLKOUT when configured as digital output push-pull	V_{PROG0} = 1.8V	Load: 470Ω//100pF (see figure 4.1a)	-	40ns	-
	V_{PROG0} = 3.3V		-	30ns	-
	V_{PROG0} = 5V		-	25ns	-
t_{FALL} on lines DIO[6..2], DIO[1..0], CLKOUT when configured as digital output push-pull	V_{PROG0} = 1.8V	Load: 470Ω//100pF (see figure 4.1a)	-	35ns	-
	V_{PROG0} = 3.3V		-	25ns	-
	V_{PROG0} = 5V		-	25ns	-
t_{RISE} on lines DIO/AO[1..0] configured as analog output	V_{PROG1} = 3V	Load: 4.7KΩ//100pF (see figure 4.1a)	-	7µs	-
	V_{PROG1} = 12V		-	11µs	-
	V_{PROG1} = 14.5V		-	12µs	-
t_{FALL} on lines DIO/AO[1..0] configured as analog output	V_{PROG1} = 3V	Load: 100pF (see figure 4.1b)	-	8µs	-
	V_{PROG1} = 12V		-	20µs	-
	V_{PROG1} = 14.5V		-	30µs	-
t_{RISE} on line VPROG0	V_{PROG0} = 0-1.8V	Load: 15Ω//10mF (see figure 4.1a)	-	10ms	-
	V_{PROG0} = 0-3.3V	Load: 22Ω//10mF (see figure 4.1a)	-	15ms	-
	V_{PROG0} = 0-5.5V	Load: 22Ω//10mF (see figure 4.1a)	-	20ms	-
t_{FALL} on line VPROG0	V_{PROG0} = 1.8-0V	Load: 10mF (see figure 41b)	-	300ms	-
	V_{PROG0} = 3.3-0V		-	350ms	-
	V_{PROG0} = 5.5-0V		-	350ms	-
t_{RISE} on line VPROG1	V_{PROG1} = 0-3V	Load: 10Ω//1mF (see figure 4.1a)	-	1.3ms	-
	V_{PROG1} = 0-5V	Load: 47Ω//1mF (see figure 4.1a)	-	1.8ms	-
	V_{PROG1} = 0-14.5V	Load: 94Ω//1mF (see figure 4.1a)	-	13ms	-
t_{FALL} on line VPROG1	V_{PROG1} = 3-0V	Load: 1mF (see figure 4.1b)	-	18ms	-
	V_{PROG1} = 5-0V		-	30ms	-
	V_{PROG1} = 14.5-0V		-	45ms	-
CLKOUT frequency			0MHz	-	50MHz

4.4 Physical and Environmental Specifications

Table 4.6: Physical and Environmental Specifications

Parameter	Value
Dimensions	150x74x11
Operating temperature	0-50°C
Operating humidity	90% max (without condensation)
Storage temperature	0-70°C
Storage humidity	90% max (without condensation)

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