www.elprotronic.com

Fast and Reliable Production Flash and Gang Programmers for MCUs and MPUs

Programmer Selection

Programmers for STM32 MP1 MPUs:

GangFlasher-ST

- STM32MP1xx, STM32MP2xx

Programmers for MCUs from Multiple Vendors:

FlashPro-X, GangPro-X

- CMSIS-DAP Debugger
- Texas Instruments
- ST Microelectronics
- Silicon Labs
- Renesas Electronics
- NXP / Freescale
- Nordic Semiconductors
- Maxim Integrated
- Microchip / Atmel
- Marvell Tech.
- Cypress Semiconductor (coming soon)
- Active Semi
- Serial Flash via SPI (Adesto, Cypress, ISSI, Macronix, Microchip, Micron, Winbond)
- STM-8 from ST Microelectronics,
- AVR and PIC from Microchip / Atmel,
- RL78 from Renesas
- iMOTION from Infineon

Programming Adapters

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Features	XStream-Iso	XStreamPro-Iso	C-GANG	S-GANG
Suffix in the Product Part Number	XS- e.g. XS-FP-ARM	X2S- e.g. X2S-FP-ARM	C-GANG	S-GANG
Data transfer speed to / from Target Device	Up to 1 Mbytes/s	Up to 1 Mbytes/s	Up to 1 Mbytes/s	Up to 1 Mbytes/s
JTAG / SWD Hi Speed	Prog. 1-15 MHz	Prog. 1-15 MHz	Prog. 1-15 MHz	Prog. 1-15 MHz
JTAG / SWD Med / Low Speed	Hi Speed divided by 2 or 4	Hi Speed divided by 2 or 4	Hi Speed divided by 2 or 4	Hi Speed divided by 2 or 4
Supported Comm. Interfaces (vary by software)	JTAG, cJTAG, SWD, SBW, BSL, DD, SPI, UART ..	JTAG, cJTAG, SWD, SBW, BSL, DD, SPI, UART ..	JTAG, cJTAG, SWD, SBW, BSL, DD, SPI, UART ..	JTAG, cJTAG, SWD, SBW, BSL, DD, SPI, UART ..
DLL for debugging	MSP430, ARM (CMSIS-DAP IAR/Keil)	MSP430, ARM (CMSIS-DAP IAR/Keil)	ARM (CMSIS-DAP IAR/Keil)	NO
RAM Buffer for real time monitoring (current, voltage)	32 kB RAM	32 kB RAM	NO	NO
Galvanic Isolation between PC and Target Device	YES	YES	NO	YES
Standalone mode	NO	YES – from internal memory	YES – from internal memory and SD	YES – from internal memory and SD
Internal Image Memory (for Standalone, Security)	NO	24 MB Flash	8 MB Flash	120 MB Flash
Blow security fuse for MSP430F1xx,2xx,4xx (Vpp 7V)	YES	YES	NO	YES
Vcc and I/O range	1.65 - 4.0 V	1.2 - 4.0 V	1.65 - 5.2 V	1.65 - 5.2 V
Vcc supplied from Adapter to Target Device	1.65-4.0 V /up to 200mA	1.2-4.0 V /up to 200mA	1.7-5.2 V, up to 200mA in total at Vcc 3.3V	1.7-5.2 V, up to 150mA each target
Icc Current measurements	20 uA – 200 mA	5 nA – 200 mA	NO	NO
Communication via USB 2.0	YES – Full Speed only	YES – Full Speed only	YES – Full and High Speed	YES – Full and High Speed
Communication via LAN (Ethernet)	-	YES	NO	YES
Adapter powered from	USB +5V	USB +5V or PoE +48V	From USB DC +5V	External power adapter 6-14V
Display results	On PC	On PC	On PC and Color LCD Display 320x240	On PC and Color LCD Display 320x240
I/O lines in 3-state	YES. Pullup 1M to Vcc	YES	YES. Pullup 1M to Vcc	YES. Pullup 1M to Vcc
Power line in 3-state	NO	YES	YES	NO
Up to 64 adapters can be connected to one PC	YES	YES	YES	YES
FCC / CE test certification	YES	YES	YES	YES
OS	Windows™ 32,64-b applications, Linux	Windows™ 32,64-b applications, Linux	Windows™ 32,64-b applications, Linux	Windows™ 32,64-b applications, Linux
Size	79 * 42 * 21 mm	79 * 42 * 21 mm	97 * 56 * 28 mm	145 * 89 * 28 mm

Supported MCUs using FP-X and GP-X software

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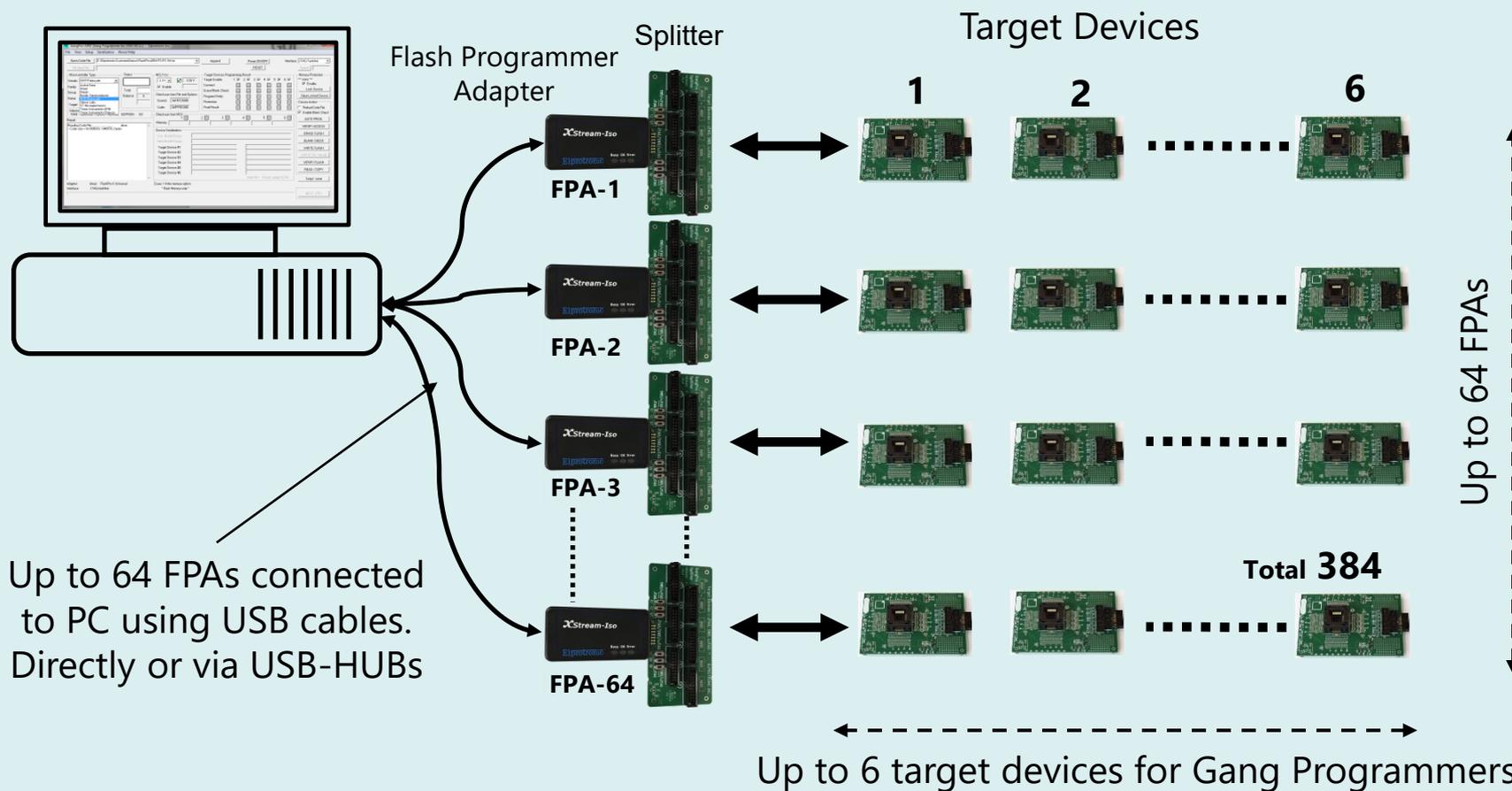| Package PN:	XStream-Iso and XStreamPro-Iso	C-GANG and S-GANG
XS-FP-X, X2S-FP-X	All MCUs, All Serial Flash *	n/a
XS-GP-X, X2S-GP-X, C-GANG-X, S-GANG	All MCUs, All Serial Flash *	All MCUs, All Serial Flash *
New: XS-FP-X-1V, XS-GP-X-1V, X2S-FP-X-1V, X2S-GP-X-1V, - Active Semi	PAC MCUs and all Serial Flash *	n/a
---,,,--- - Analog Devices	AD MCUs and all Serial Flash *	n/a
---,,,--- - Giga Device	GD32-xx and all Serial Flash *	n/a
---,,,--- - Infineon	iMOTION, PSoC, Traveo T2G, FMx, XMC and all Serial Flash *	n/a
---,,,--- - Marvell	88MMxx and all Serial Flash *	n/a
---,,,--- - Maxim	MAX32xxx and all Serial Flash *	n/a
---,,,--- - Microchip	SAMxx, AVR, PIC and all Serial Flash *	n/a
---,,,--- - Nordic Semiconductors	nRF5xx and all Serial Flash *	n/a
---,,,--- - NXP	iMX, Kinetis, LPC, S32x, K32x, JN51xx, QN9xx, MCXA, ColdFire and all Serial Flash *	n/a
---,,,--- - Renesas	ARM Synergy, ARM Advanced Raxx, RL78 and all Serial Flash *	n/a
---,,,--- - Silergy	MAX71xx and all Serial Flash *	n/a
---,,,--- - Silicon Labs	EFM32, EFR32, SiM3, EM3xx and all Serial Flash *	n/a
---,,,--- - ST Microelectronics	STM32xx, STSPIN32, STM-BlueNRG, STM8 and all Serial Flash *	n/a
---,,,--- - Texas Instruments	MSPM0, MSP32, Tiva-C, MSP430, TI-Connectivity CCxx, C2000 and all Serial Flash *	n/a
Old XS-FP-ARM, XS-GP-ARM, X2S-FP-ARM, X2S-GP-ARM,	The same as before	n/a
Old XS-FP-ARM-1V, XS-GP-ARM-1V, X2S-FP-ARM-1V, X2S-GP-ARM-1V,	The same as before	n/a
Old XS-FP, XS-GP-M, X2S-FP-M, X2S-GP-M,	The same as before	n/a
Old XS-FP-1V, XS-GP-M-1V, X2S-FP-M-1V, X2S-GP-M-1V,	The same as before	n/a
Old XS-FP-430, XS-GP-430, X2S-FP-430, X2S-GP-430,	The same as before	n/a
Old XS-FP-2000, X2S-FP-2000	The same as before	n/a

*Note * - All MCUs, All Serial Flash or defined MCUs family means MCUs, Serial Flash and Serial EEPROM supported by FP-X and GP-X software.*

General Features
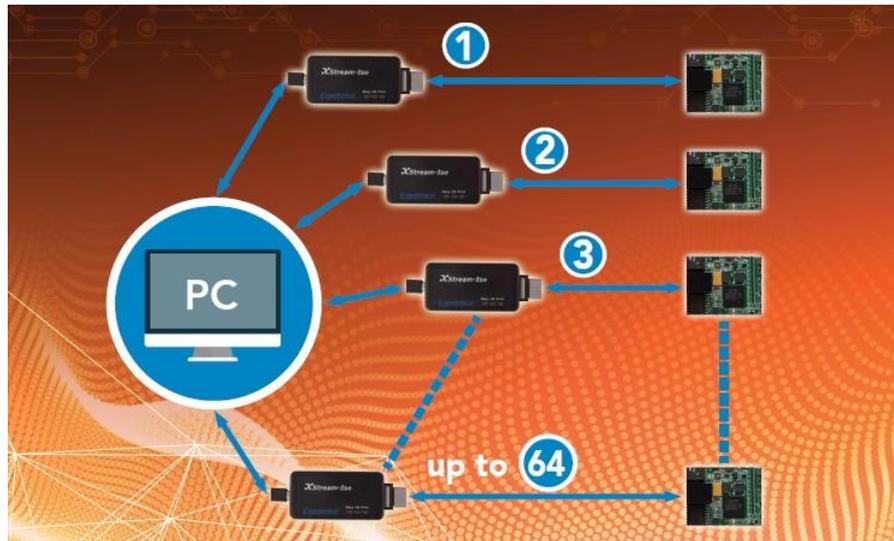
- Up to 64 Flash Programming Adapters (FPAs) can be connected to one PC.
- Supports JTAG, cJTAG, SWD, SBW, BSL, SPI, UART communication interfaces (interface list depends on supported devices)
- Programmable JTAG communication speed (if applicable) up to 15 MHz
- Transfer speed up to 1 MBytes/sFull memory or page memory erase capability
- Check Sum verification
- No code size limitations
- Target device can be powered from the programming adapter or from external source
- Easy to use Windows™ based software, Debian Linux support (amd64/armhf) . Also runs on Raspberry Pi.
- Accepts TI (*.txt), Motorola (*.s19, *.s28, *.s37, *.srec) and Intel (*.hex) data files
- Lock setup capability, useful in production
- Software package can assign and automatically increment a serial number, model type and revision. Serial Number with or without an automatically inserted current date can be stored in Flash memory in HEX, BCD or ASCII format
- DLL software package can control up to 64 FPAs from user application
- USB-2.0 communication between PC and programming adapter. The *XStreamPro-Iso* and *S-GANG* adapter also provide communication via LAN
- Programming adapter has been fully tested to comply with FCC and CE requirements

Multiple Gang Programmers Setup

Splitter

Flash Programmer Adapter

Target Devices

1   2   6

FPA-1

FPA-2

FPA-3

FPA-64

Up to 64 FPAs

Total 384

Up to 64 FPAs connected to PC using USB cables. Directly or via USB-HUBs

Up to 6 target devices for Gang Programmers

Flash Programmer

Single Target: Each FPA programs one target. Up to 64 target devices can be programmed simultaneously
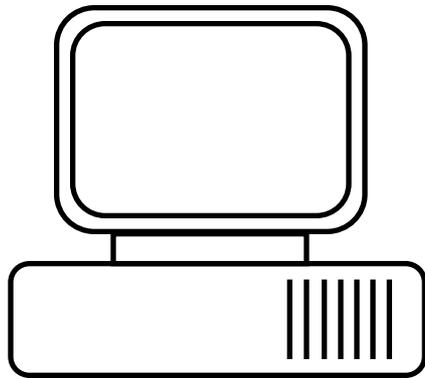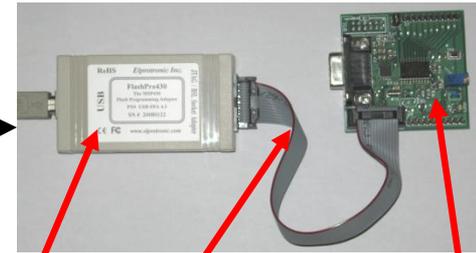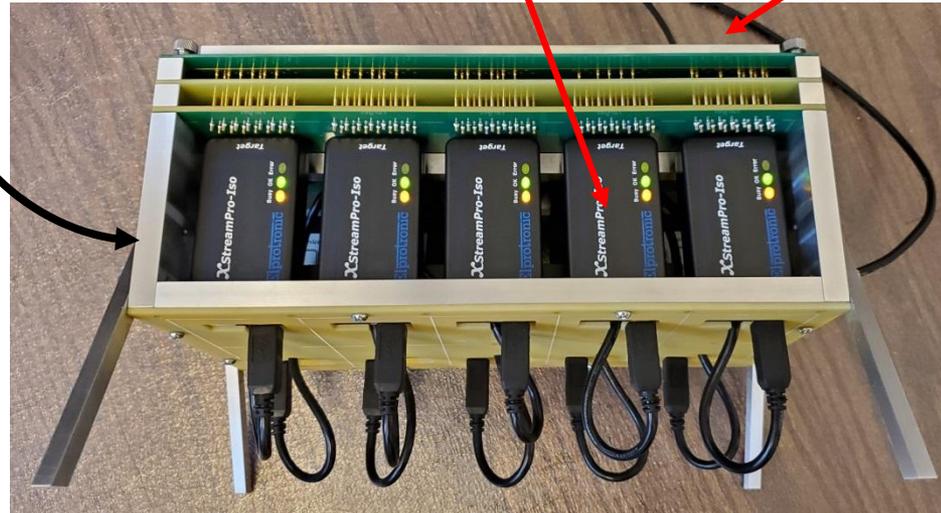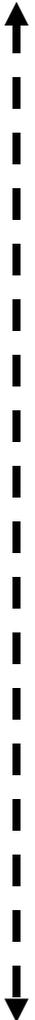
Directly

14-wires ribbon cable

FPA

Target Device

Via USB HUB

Up to 64 FPAs connected to PC using USB cables. Directly or via USB-HUB

Up to 64 FPAs to one PC

Gang Programmer

Multiple Targets: Each FPA programs up to 6 targets. Up to 384 target devices in panel can be programmed simultaneously

Directly

Via USB HUB

PCB Panel

Access to boards via nails
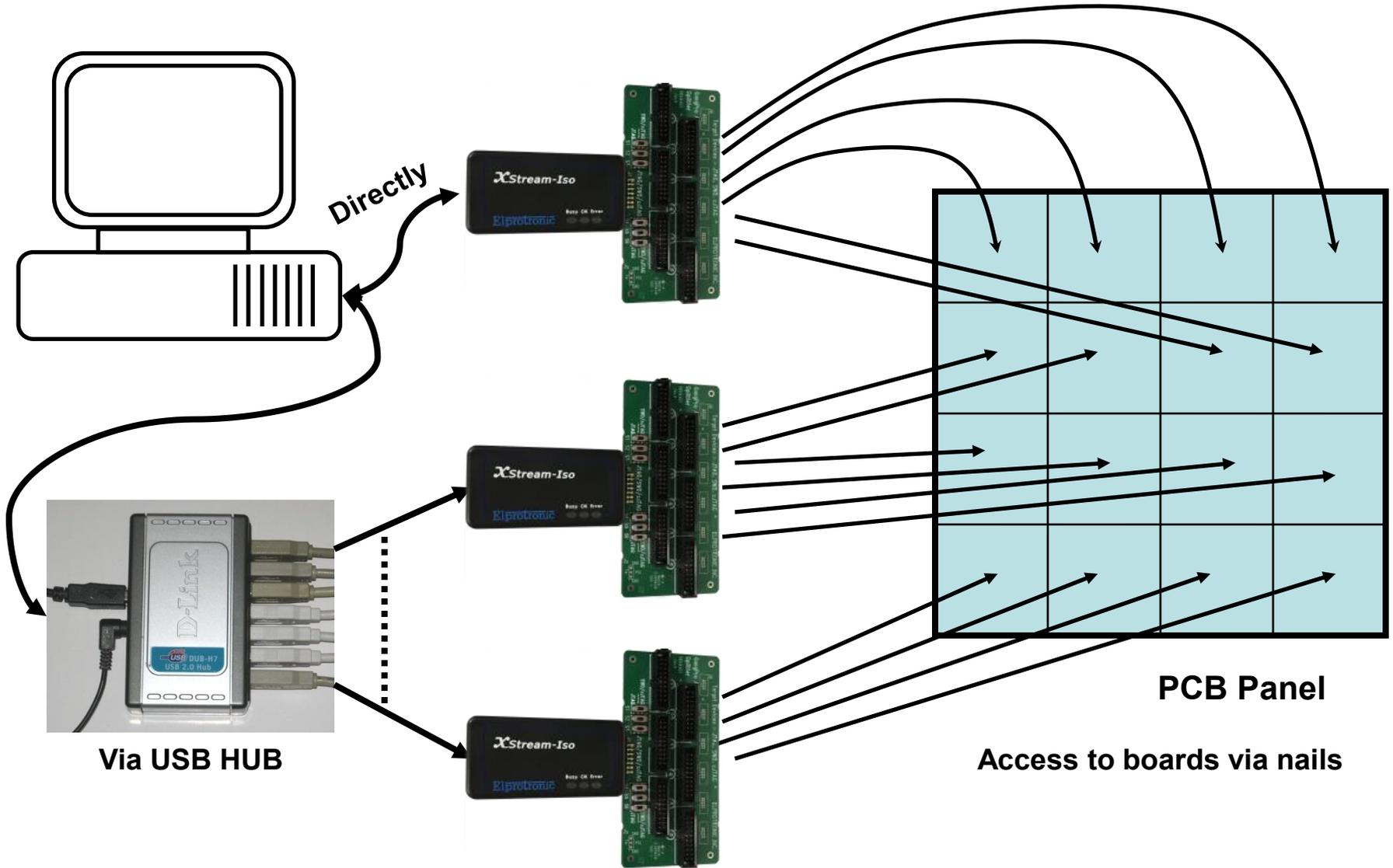
GUI – Main Screen

* Software package contains ready to use GUI for FlashPro-X and GangPro-X.

* One GUI controls one adapter only.

* Easy to use setup, serialization, MCU protection and more.

FlashPro-X GUI
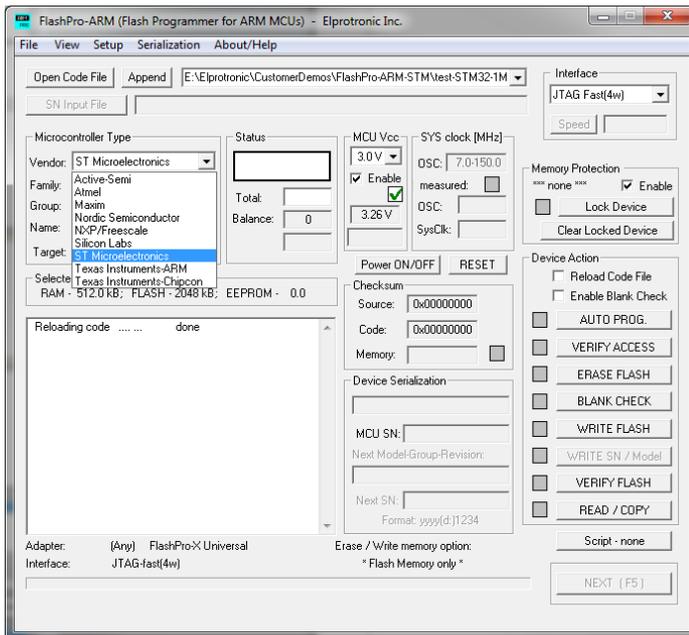
GangPro-X GUI

GUI - Serialization
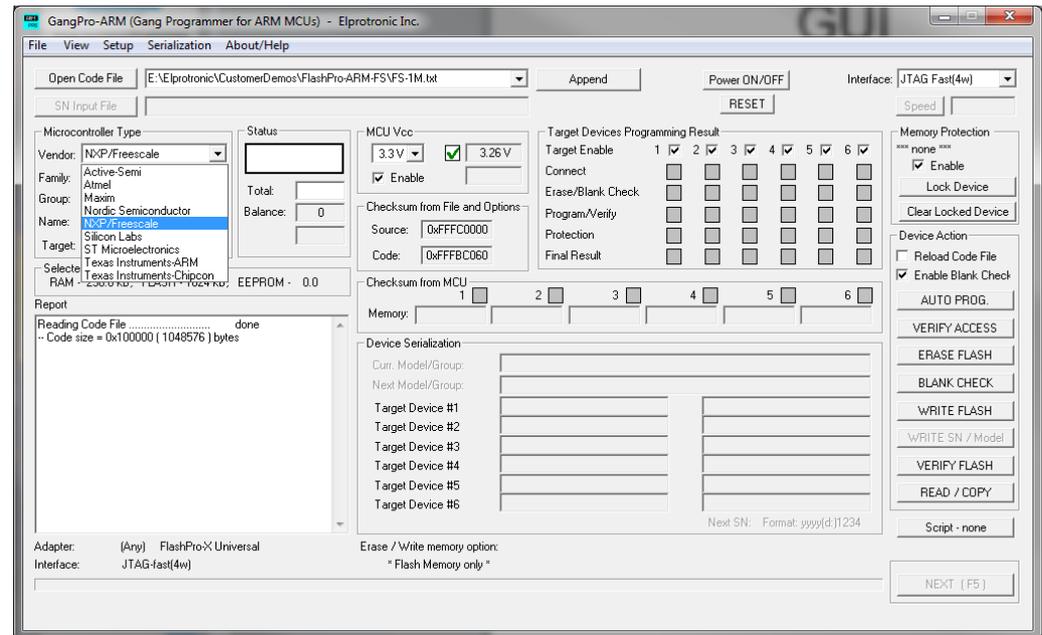
- **7 fixed serialization formats**
- **Custom defined format**
- **Programmable serialization location**
- **Serialization log file**
- **Supported Bar Code Scanner**

Control all FPAs using one DLL via Application

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Use only one DLL: Thread-safe Generic DLL or broadcast-style Multi-FPA DLL

Control all FPAs using one DLL via Application

Elprotronic
www.elprotronic.com
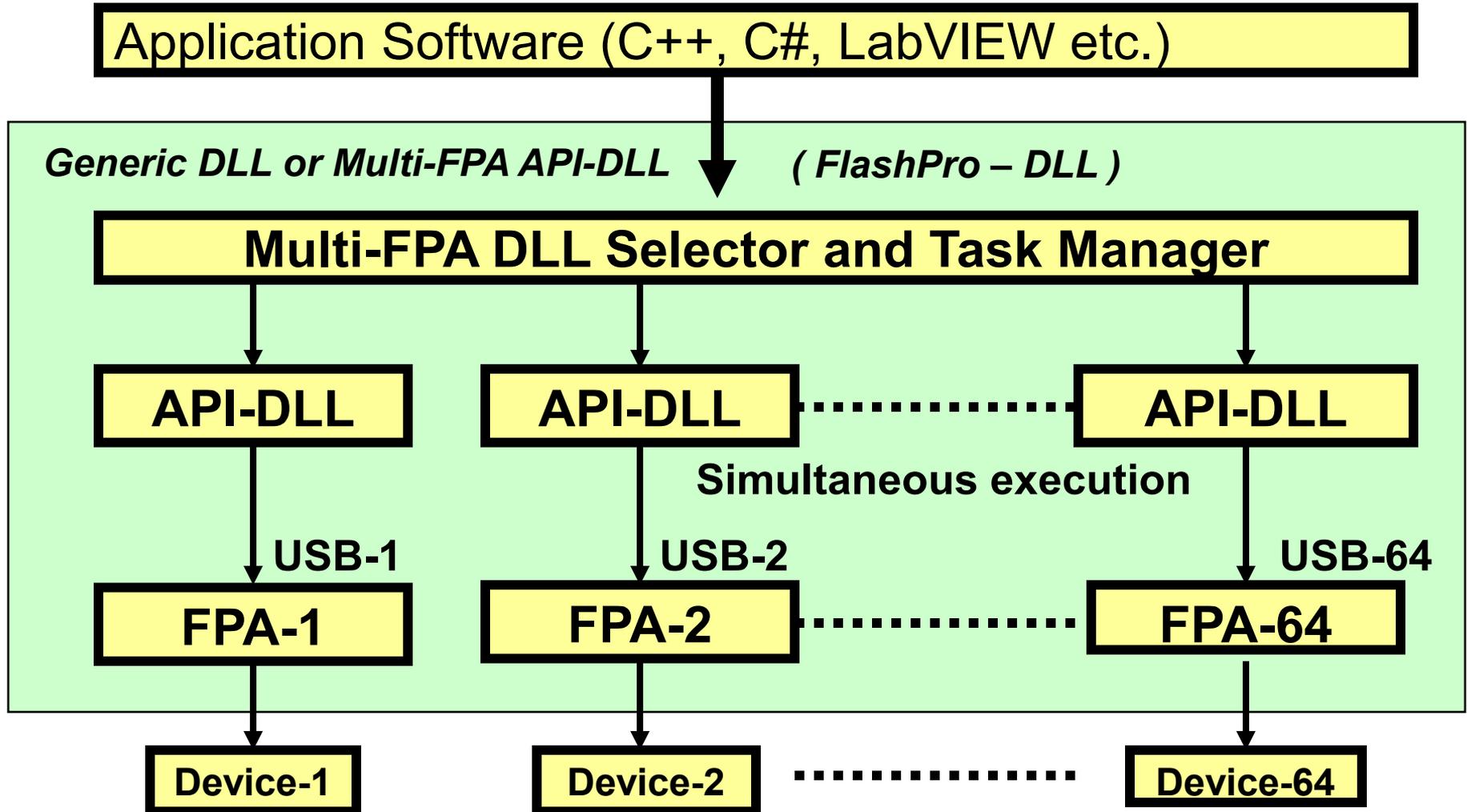
Use only one DLL: Thread-safe Generic DLL or broadcast-style Multi-FPA DLL

Application Software (C++, C#, LabVIEW, etc.)

Generic DLL or Multi-FPA API-DLL   (GangPro – DLL)

Generic DLL or Multi-FPA DLL Selector and Task Manager

API-DLL   **API-DLL** .... **API-DLL**

Simultaneous execution

USB-1   USB-2   USB-64

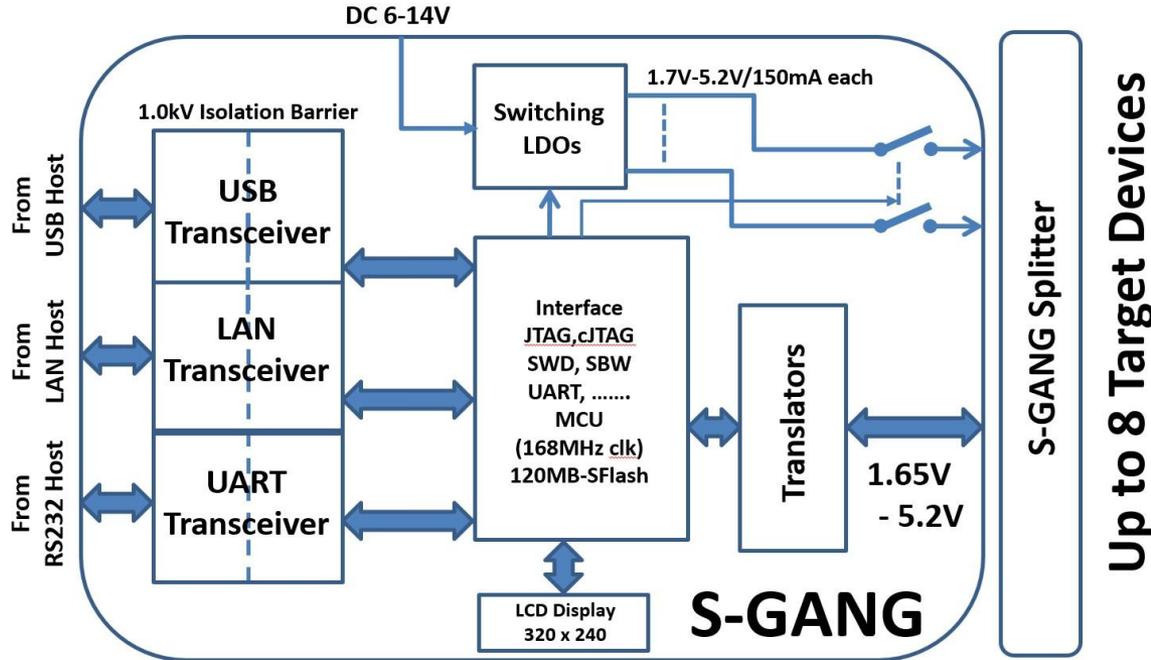**FPA-1**   **FPA-2** **FPA-64**

Device-6   Device-12 .... Device-384
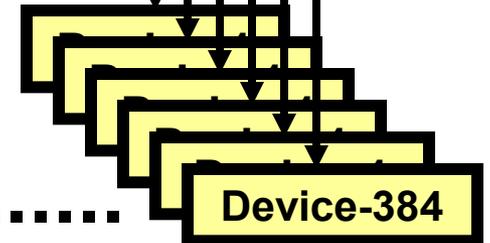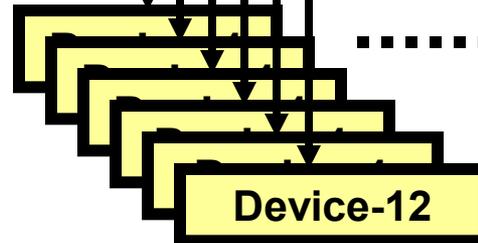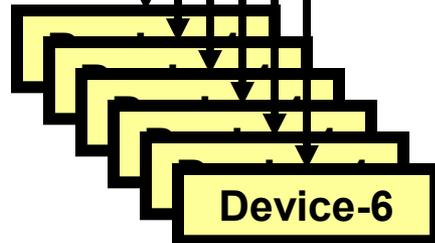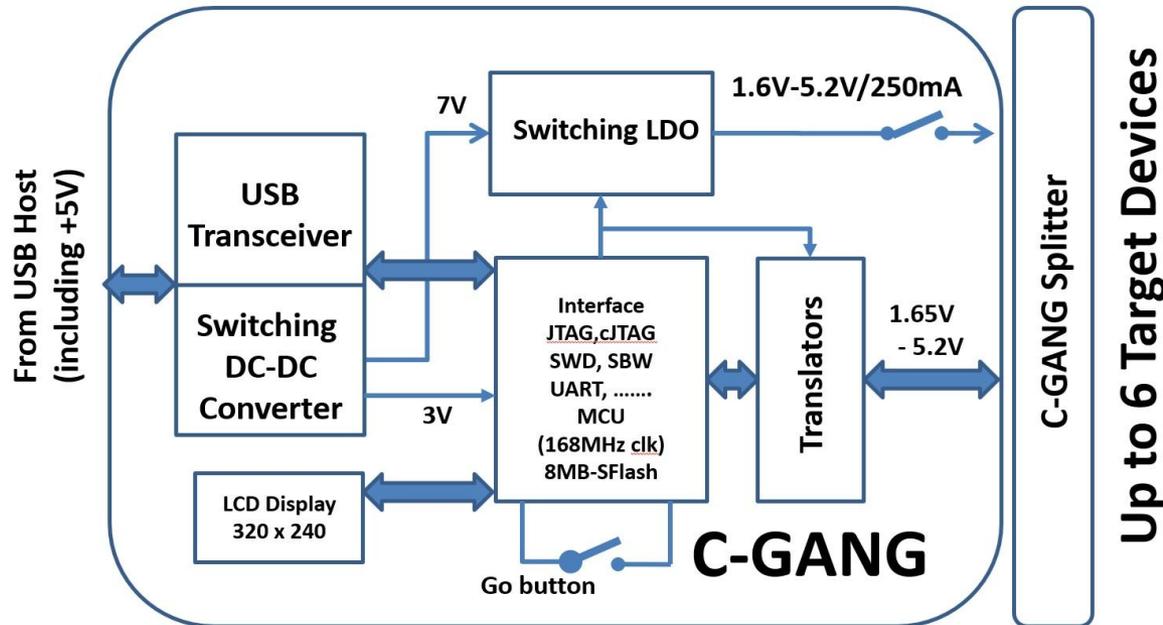
S-GANG Programming Adapter

NEW

Features:

- Data transfer up to 1 Mbytes/s
- JTAG/SWD speed up to 15 MHz
- Galvanic Isolation 1.0 kV on USB, Ethernet and UART connections
- Vcc: 1.65 – 5.2 V, current up to 150 mA each target
- Communication via USB 2.0 or LAN. Power from external power adapter 6-14V
- Up to 64 adapters can be connected to one PC
- Image Memory for project storage – 120 MB
- Size 145 x 89 x 28 mm
- Software compatible with the GangPro-X
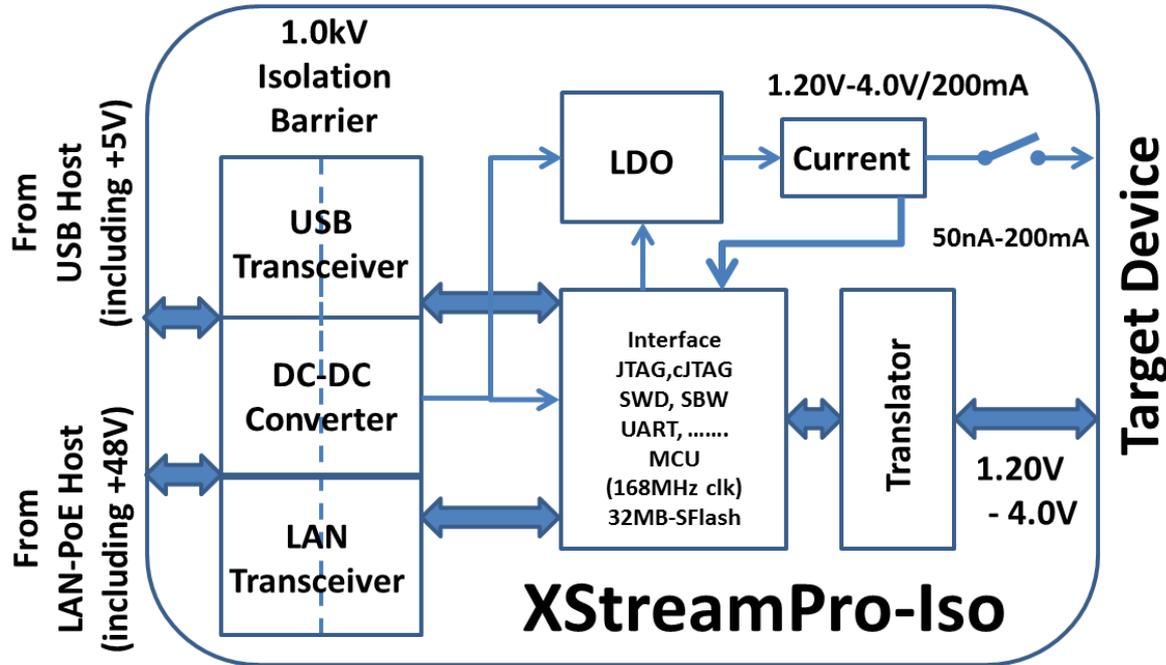- FCC / CE test certification

C-GANG Programming Adapter

Features:

- Data transfer up to 1 Mbytes/s
- JTAG/SWD speed up to 15 MHz
- No Galvanic Isolation
- Vcc: 1.65 – 5.2 V, current up to 250 mA in total
- Communication via USB 2.0. Power from USB connector DC = 5V
- Up to 64 adapters can be connected to one PC
- Image Memory for project storage – 8 MB
- Size 97 x 56 x 28 mm
- Software compatible with the GangPro-X
- FCC / CE test certification

XStreamPro-Iso Programming Adapter

Features:

- Data transfer up to 1 Mbytes/s
- JTAG/SWD speed up to 20 MHz
- Galvanic Isolation 1.0 kV
- Vcc: 1.2 – 4.0 V, current up to 200 mA
- Current measurements 5nA – 200 mA
- Communication via USB 2.0 or LAN. Power from USB (5V) or from LAN PoE (48V)
- I/O lines and Power line are isolated from target device if XStreamPro-Iso is in idle mode
- Up to 64 adapters can be connected to one PC
- Image Memory for project storage (in the future) – 24 MB
- Size 79 * 42 * 21 mm
- Software compatible with the old USB-FPA (FlashPro430, FlashPro-ARM……)
- FCC / CE test certification

XStreamPro-Iso Programming Adapter
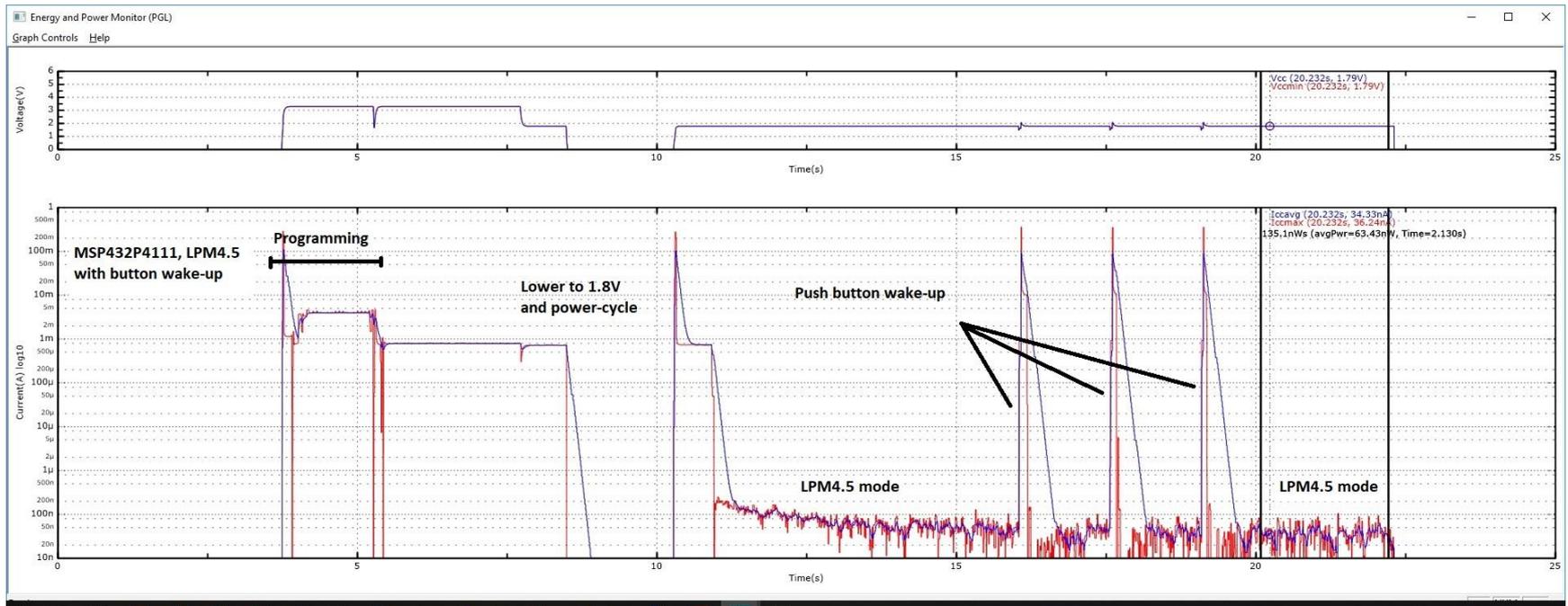
Features:

- **Vcc measurement – up to 6V.**
- **Current measurements 50nA – 200 mA**
- **Time resolution – up to 1ms for Vcc and up to 10ms for current measurements**
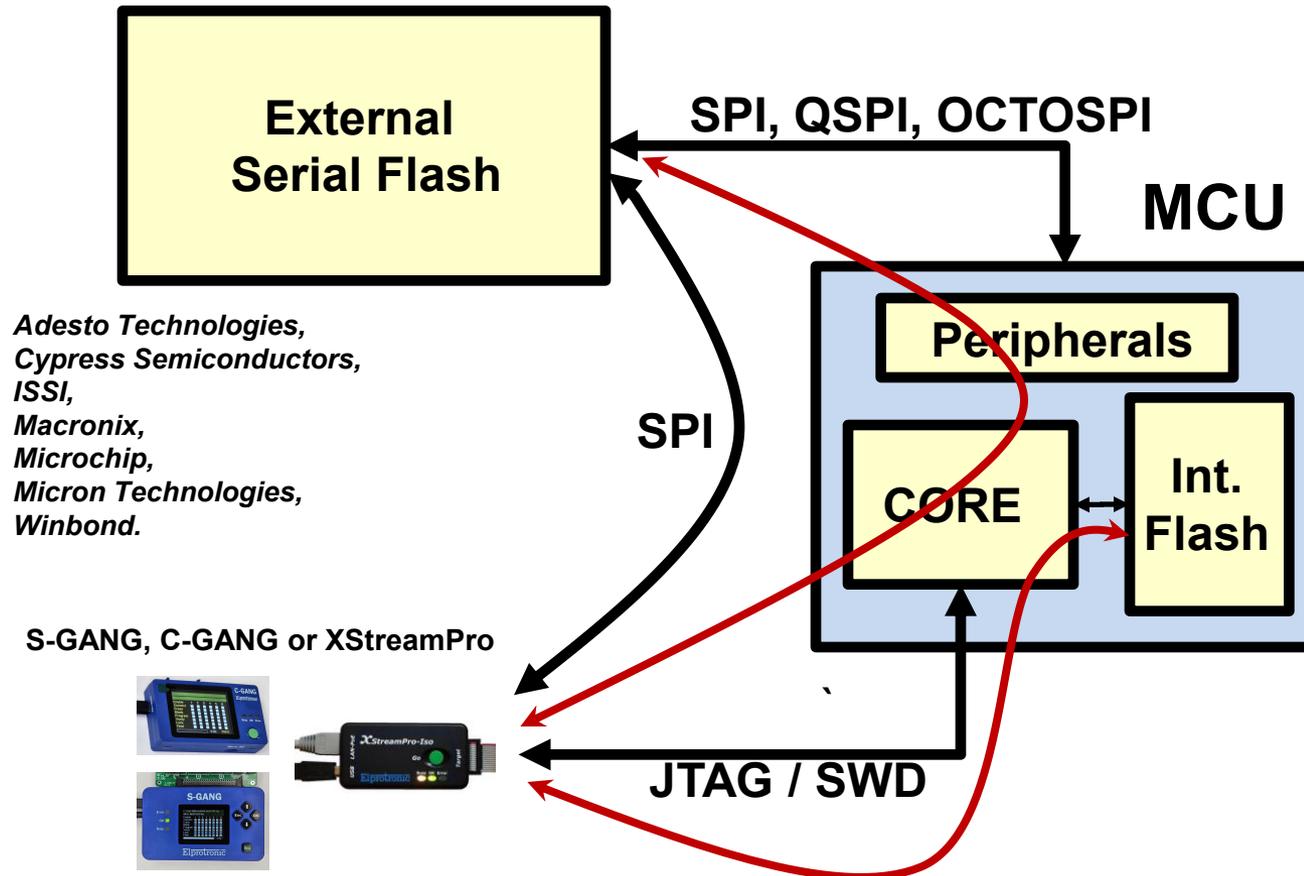
Standalone mode Programming Adapters
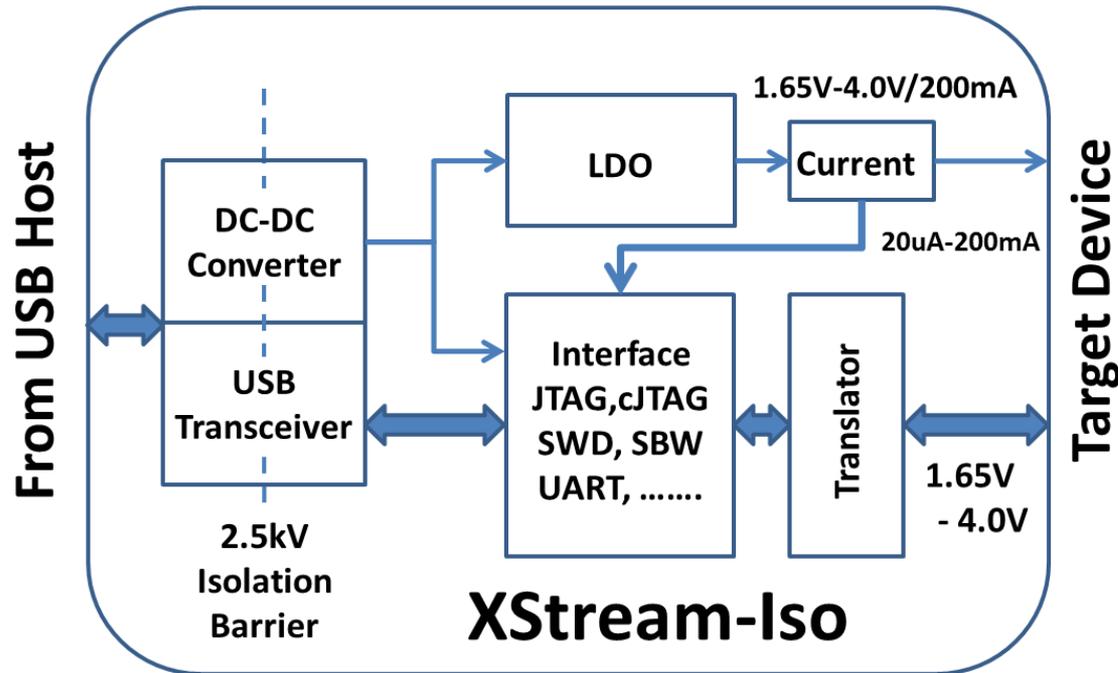
Features:

- **Standalone programming feature (code and configuration in internal flash. Auto Program with GO button).**
- **S-GANG - Up to 60 distinct images, or 120 MB total in size.**
- **C-GANG - One images up to 8 MB size.**
- **XStreamPro - Up to 96 distinct images, or 24 MB total in size.**
- **Images support production quota (maximum units programmed per image).**
- **Images support serialization features.**
- **Configurable GO feature: from button or when detected Vcc on target device.**

External Serial Flash Programming

**External
Serial Flash**

SPI, QSPI, OCTOSPI

MCU

*Adesto Technologies,
Cypress Semiconductors,
ISSI,
Macronix,
Microchip,
Micron Technologies,
Winbond.*

Peripherals

SPI

CORE

**Int.
Flash**

S-GANG, C-GANG or XStreamPro

JTAG / SWD

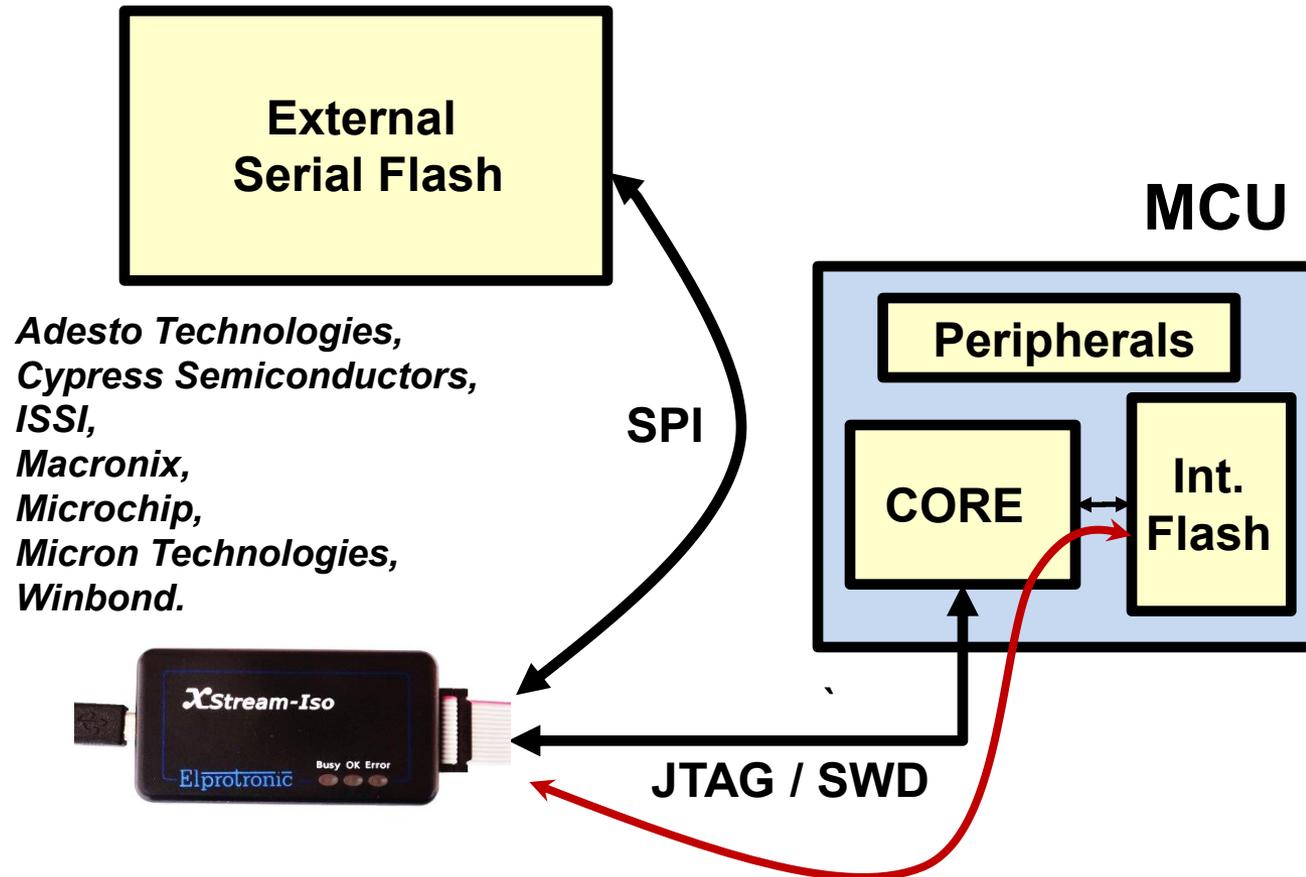**External and Internal Flash Programming via JTAG/SWD**

XStream-Iso Programming Adapter

Features:

- Data transfer up to 1 Mbytes/s
- JTAG/SWD speed up to 20 MHz
- Galvanic Isolation 2.5 kV
- Vcc: 1.65 – 4.0 V, current up to 200 mA
- Current measurements 20uA – 500 mA
- Up to 64 adapters can be connected to one PC
- Size 79 * 42 * 21 mm
- Software compatible with the old USB-FPA (FlashPro430, FlashPro-ARM......)
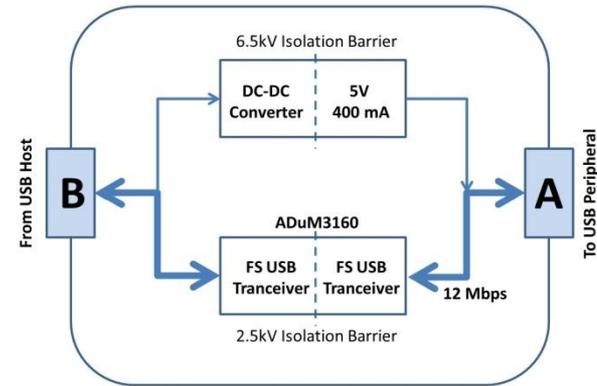- FCC / CE test certification

XStream-Iso Programming Adapter

**External and Internal Flash Programming
via SPI or JTAG/SWD**

Other Products

USB Full Speed Isolator

Universal Socket Boards:

QFN-32, QFN-48, QFN-64, QFP-32, QFP-48, QFP-64, QFP-80, QFP-100, QFP-144