

The logo for Elprotronic, featuring the word "Elprotronic" in a stylized, blue, serif font with a white outline, set against a solid blue rectangular background.

Elprotronic

[www.elprotronic.com](http://www.elprotronic.com)

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

*PM037A03 rev. 1.8*

*May.26.2023*

# Programmer Selection

## Programmers for STM32 MP1 MPUs:

### GangFlasher-ST

- STM32MP1xx

## Programmers for ARM MCUs from Multiple Vendors:

### FlashPro-ARM, GangPro-ARM

- 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
- **Programmers for MCUs from Texas Instruments only:**

**FlashPro430, GangPro430, FET-Pro430** - supports all MSP430 MCUs

**FlashPro-CC, GangPro-CC** - supports *all Wireless Solution (Chipcon) MCUs*

**FlashPro-2000** - supports C2000 MCUs

## Programmers for 8-32b MCUs:




### FlashPro-M, GangPro-M

- *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*

# Software Selector Guide

| MCU Vendor            | MCU Family  | Gang Flasher<br>-ST | FlashPro-ARM<br>GangPro-ARM<br>CMSIS-DAP | FlashPro430<br>GangPro430 | FlashPro-CC<br>GangPro-CC | FlashPro-<br>2000 | FlashPro-M<br>GangPro-M |
|-----------------------|---|---------------------|--|---------------------------|---------------------------|-------------------|-------------------------|
| Texas Instruments     | MSP430, CC430   |                     |  | +                         |                           |                   |                         |
| Texas Instruments     | ARM MSP432  |                     | +  |                           |                           |                   |                         |
| Texas Instruments     | TMS320F28xx   |                     |  |                           |                           | +                 |                         |
| Texas Instruments     | Cxx Wireless Solution 8051 Core                             |                     |  |                           | +                         |                   |                         |
| Texas Instruments     | Cxx Wireless Solution ARM Core                              |                     | +  |                           |                           |                   |                         |
| ST Microelectronics   | STM32MP1xx MPU  | +                   |  |                           |                           |                   |                         |
| ST Microelectronics   | ARM STM32   |                     | +  |                           |                           |                   |                         |
| ST Microelectronics   | STM-8   |                     |  |                           |                           |                   | +                       |
| Active Semi           | ARM PAC5xx  |                     | +  |                           |                           |                   |                         |
| Analog Devices        | ARM ADuCM   |                     | +  |                           |                           |                   |                         |
| Infineon / Cypresses  | ARM PSoC, FMxx, iMOTION                                     |                     | +  |                           |                           |                   | + (iMOTION)             |
| Microchip (Atmel)     | ARM AT-SAMxx  |                     | +  |                           |                           |                   |                         |
| Microchip (Atmel)     | AVR   |                     |  |                           |                           |                   | +                       |
| Microchip             | PIC   |                     |  |                           |                           |                   | +                       |
| Marvel                | ARM 88MC2xx / 88MW3xx                                       |                     | +  |                           |                           |                   |                         |
| Maxim                 | ARM MAX 326xx   |                     | +  |                           |                           |                   |                         |
| Nordic Semiconductors | ARM nRFxxx  |                     | +  |                           |                           |                   |                         |
| NXP / Freescale       | ARM iMX, Kinetis, LPCxx                                     |                     | +  |                           |                           |                   |                         |
| Renesas               | ARM Synergy   |                     | +  |                           |                           |                   |                         |
| Renesas               | RL78  |                     |  |                           |                           |                   | +                       |
| Silergy               | ARM MAXxx   |                     | +  |                           |                           |                   |                         |
| Silicon Labs          | ARM EFM32, EFR32, Sim3, EM3                                 |                     | +  |                           |                           |                   |                         |
| Serial Flash via SPI  | Adesto, Cypress, ISSI, Macronix, Microchip, Micron, Winbond |                     |  |                           |                           |                   | +                       |

# Programmer Selector Guide




| Package Name                               | Price [USD]  | Target MCUs                    | Software                       | <br>USB-FPA | <br>XStream- | <br>XStreamPro- |
|--|--------------|--------------------------------|--------------------------------|--|---|--|
| FlashPro430 – Standard [ XS, X2S ]         | 299/419/619  | MSP430                         | FlashPro430                    | PN: USB-MSP430-FPA-STD   | PN: XS-FP-430   | PN: X2S-FP-430   |
| FlashPro-MSP [ XS, X2S ]                   | 359/479/679  | MSP430 / MSP432                | FlashPro430 / FlashPro-ARM     | -  | PN: XS-FP-MSP   | PN: X2S-FP-MSP   |
| GangPro430 – JTAG / BSL [ XS, X2S ]        | 339/659/859  | MSP430                         | GangPro430 / FlashPro430       |  | PN: XS-GP-430   | PN: X2S-GP-430   |
| FlashPro-CC – Standard [ XS, X2S ]         | 299/419/619  | CCxx                           | FlashPro-CC / FlashPro-ARM     |  | PN: XS-FP-CC  | PN: X2S-FP-CC  |
| GangPro-CC [ XS, X2S ]                     | 539/659/859  | CCxx                           | GangPro-CC / GangPro-ARM       |  | PN: XS-GP-CC  | PN: X2S-GP-CC  |
| FlashPro-2000 – Standard [ XS, X2S ]       | 299/419/619  | TMS320C28xx                    | FlashPro-2000                  | PN: FP2000-STD   | PN: XS-FP-2000  | PN: X2S-FP-2000  |
| FlashPro-ARM – One Vendor [ XS, X2S ]      | --/459/659   | ARM Limited to One Vendor(***) | FlashPro-ARM                   | -  | PN: XS-FP-ARM-1V  | PN: X2S-FP-ARM-1V (**)   |
| FlashPro-ARM [ XS, X2S ]                   | --/569/769   | See ARM list in the website    | FlashPro-ARM                   | -  | PN: XS-FP-ARM   | PN: X2S-FP-ARM (**)  |
| GangPro-ARM – One Vendor [ XS, X2S ]       | --/909/1109  | ARM Limited to One Vendor(***) | GangPro-ARM / FlashPro-ARM     | -  | PN: XS-GP-ARM-1V  | PN: X2S-GP-ARM-1V (**)   |
| GangPro-ARM [ XS, X2S ]                    | --/1019/1319 | See ARM list in the website    | GangPro-ARM / FlashPro-ARM     | -  | PN: XS-GP-ARM   | PN: X2S-GP-ARM (**)  |
| FlashPro-M – One Vendor [ XS, X2S ]        | --/419/619   | Limited to One Vendor (***)    | FlashPro-M                     | -  | PN: XS-FP-M-1V  | PN: X2S-FP-M-1V  |
| FlashPro-M [ XS, X2S ]                     | --/529/729   | Serial Flash, STM-8, PIC, AT   | FlashPro-M                     | -  | PN: XS-FP-M   | PN: X2S-FP-M   |
| GangPro-M – One Vendor [ XS, X2S ]         | --/759/969   | Limited to One Vendor (***)    | GangPro-M / FlashPro-M         | -  | PN: XS-GP-M-1V  | PN: X2S-GP-M-1V  |
| GangPro-M [ XS, X2S ]                      | --/869/1069  | Serial Flash, STM-8            | GangPro-M / FlashPro-M         | -  | PN: XS-GP-M   | PN: X2S-GP-M   |
| Universal FlashPro-X Programmer [ XS,X2S ] | --/719/919   | Any above                      | Any Flash-.. Above             | -  | PN: XS-FP-X   | PN: X2S-FP-X   |
| Universal GangPro-X Programmer [ XS,X2S ]  | --/1119/1319 | Any above                      | Any Flash-.. and Gang-.. Above | -  | PN: XS-GP-X   | PN: X2S-GP-X   |

Note: (\*) Lite version – software without access to DLLs, serialization and script files.

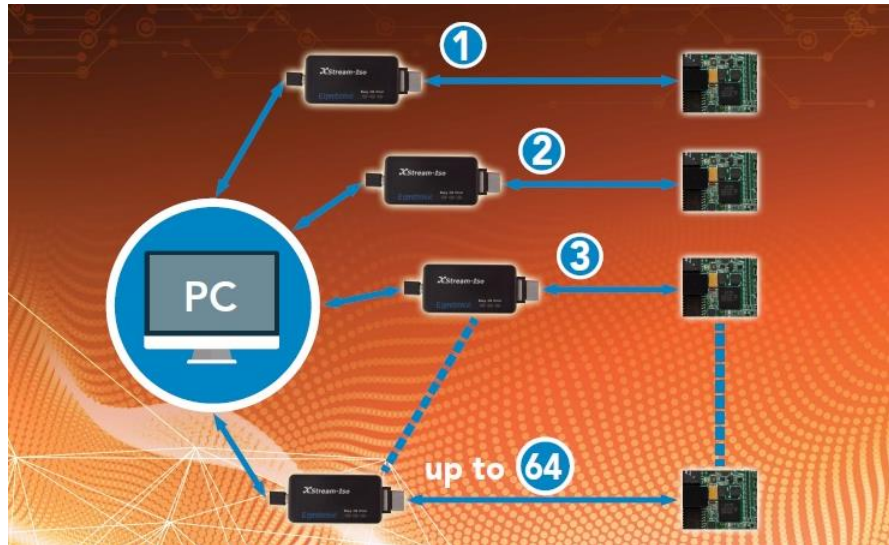
(\*\*) Supports Serial Flash programming via JTAG/SWD and MCU using FlashPro-ARM/GangPro-ARM software or via SPI using FlashPro-M/GangPro-M software

(\*\*\*) Limited to one Vendor e.g. TI only, NXP only etc.

# Programming Adapters

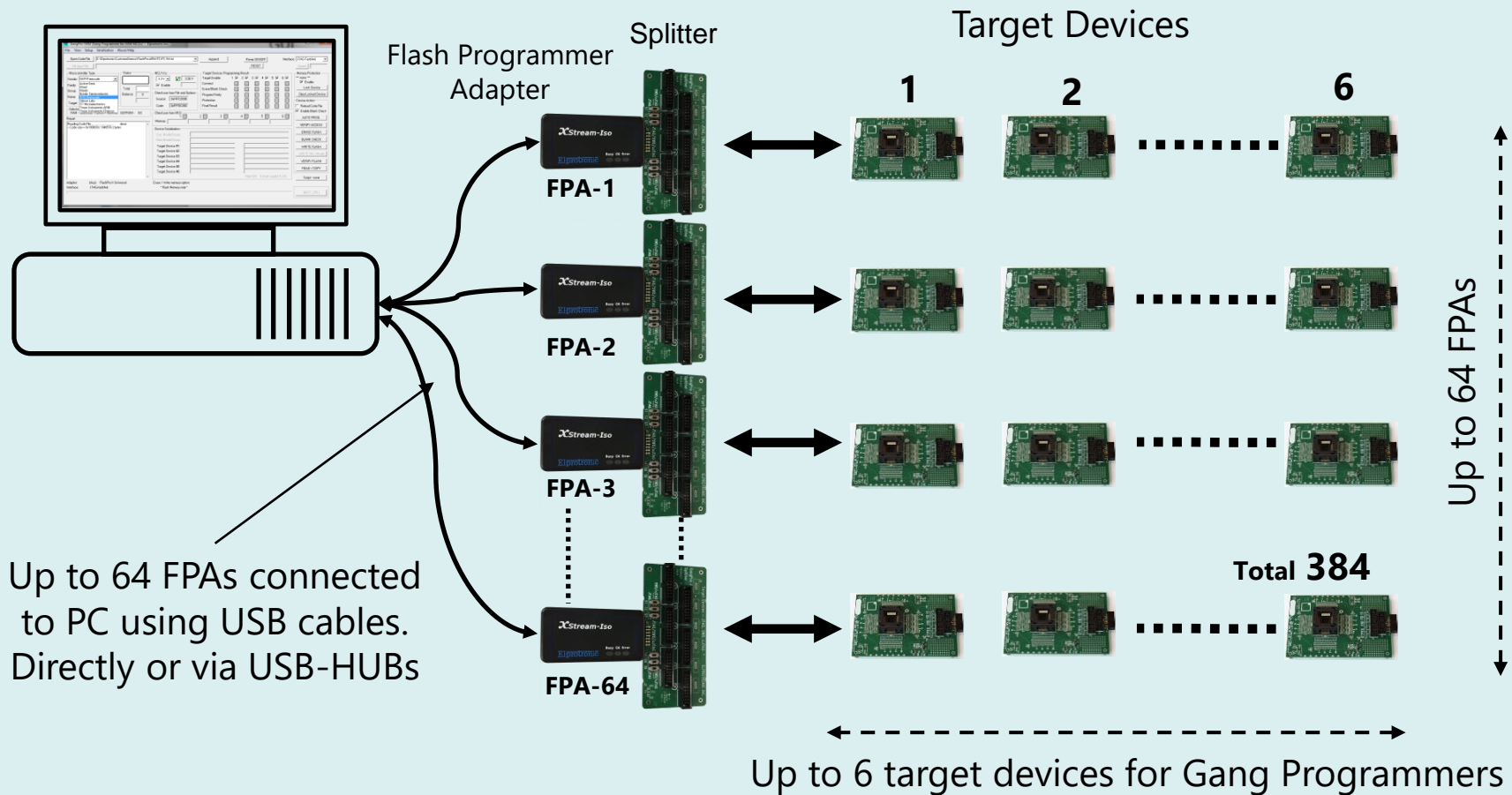
| Features  | USB-FPA<br> | XStream-Iso<br> | XStreamPro-Iso<br> |
|---|--|--|---|
| Suffix in the Product Part Number                       | none e.g. FP-ARM   | XS- e.g. XS-FP-ARM   | X2S- e.g. X2S-FP-ARM  |
| Data transfer speed to / from Target Device             | Up to 100 kbytes/s   | Up to 1 Mbytes/s   | Up to 1 Mbytes/s  |
| JTAG / SWD Hi Speed                                     | Fixed ~ 1.5MHz   | Prog. 1-20MHz  | Prog. 1-20MHz   |
| JTAG / SWD Med / Low Speed                              | 800kHz / 400kHz  | 800kHz / 400kHz  | 800kHz / 400kHz   |
| Supported Comm. Interfaces (vary by software)           | JTAG, cJTAG, SWD, SBW, BSL, DD, UART ..  | JTAG, cJTAG, SWD, SBW, BSL, DD, SPI, UART ..   | JTAG, cJTAG, SWD, SBW, BSL, DD, SPI, UART ..  |
| DLL for debugging                                       | MSP430   | MSP430, ARM (CMSIS-DAP IAR/Keil)   | MSP430, ARM (CMSIS-DAP IAR/Keil)  |
| Image Memory ( for Standalone, Security )               | -  | -  | 24 MB Flash   |
| RAM Buffer for real time monitoring ( current, voltage) | -  | 32 kB RAM  | 32 kB RAM   |
| Galvanic Isolation between PC and Target Device         | -  | YES  | YES   |
| Vcc and I/O range                                       | 1.65 - 4.0 V   | 1.65 - 4.0 V   | 1.2 - 4.0 V   |
| Vcc supplied from Adapter to Target Device              | 1.65-4.0 V /up to 200mA  | 1.65-4.0 V /up to 200mA  | 1.2-4.0 V /up to 200mA  |
| Icc Current measurements                                | -  | 20 uA – 200 mA   | 5 nA – 200 mA   |
| Communication via USB 2.0 Full Speed                    | YES  | YES  | YES   |
| Communication via LAN (Ethernet)                        | -  | -  | YES   |
| Adapter powered from                                    | USB +5V  | USB +5V  | USB +5V or PoE +48V   |
| I/O lines in 3-state                                    | YES. Pullup 1M to Vcc  | YES. Pullup 1M to Vcc  | YES   |
| Power line in 3-state                                   | -  | -  | YES   |
| Up to 64 adapters can be connected to one PC            | YES  | YES  | YES   |
| FCC / CE test certification                             | YES  | YES  | YES   |
| OS  | Windows™ 32-b applications   | Windows™ 32,64-b applications, Linux   | Windows™ 32,64-b applications, Linux  |
| Size  | 79 * 42 * 21 mm  | 79 * 42 * 21 mm  | 79 * 42 * 21 mm   |

# General Features

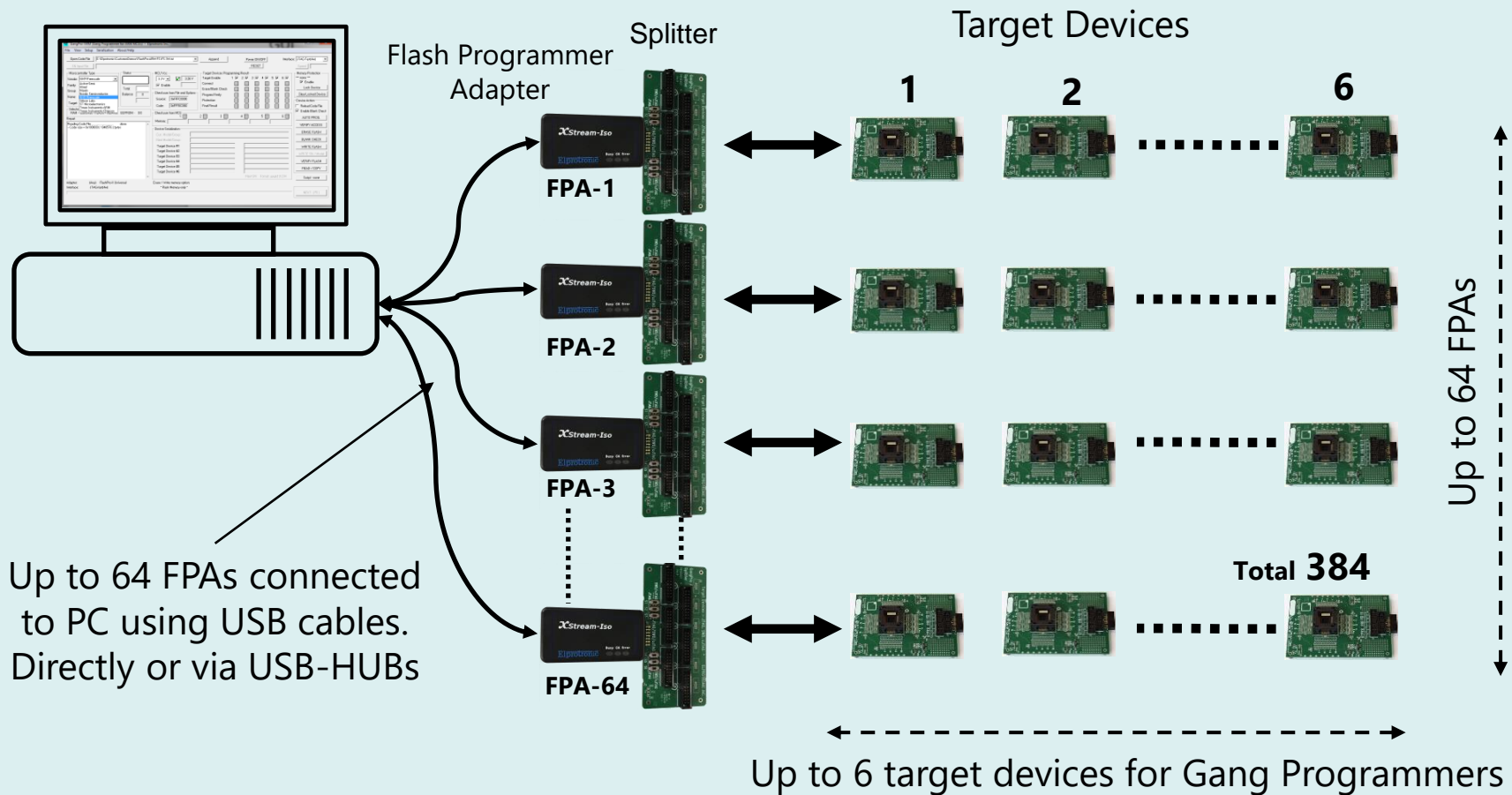


- Up to 64 Flash Programming Adapters (FPAs) can be connected to one PC.
- Supports JTAG, cJTAG, SWD, SBW, BSL, SPI, UART communication interfaces (interface list depends on supported devices)
- Programmable JTAG communication speed (if applicable) up to 20 MHz with *Xstream-Iso* and *XstreamPro-Iso* adapters and up to 4 MHz with old *USB-FPA* adapter
- Transfer speed up to 1 MBytes/s with *Xstream-Iso* and *XstreamPro-Iso* adapters and up to 50 kBytes/s with old *USB-FPA* adapter
- Full 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. For *Xstream-Iso* and *XstreamPro-Iso* adapters also 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 Full-Speed to communication between PC and programming adapter. The *XstreamPro-Iso* adapter also provide communication via LAN
- Programming adapter has been fully tested to comply with FCC and CE requirements

# Multiple Gang Programmers Setup



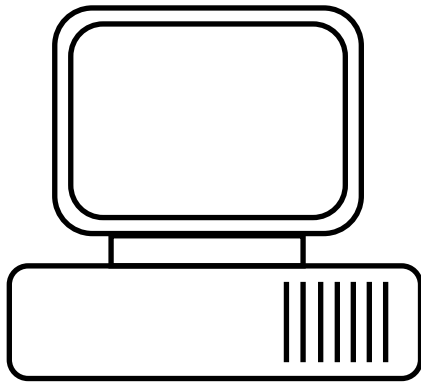
# Multiple Gang Programmers Setup





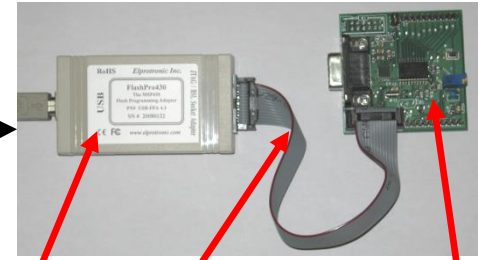
# Flash Programmer

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



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

Directly

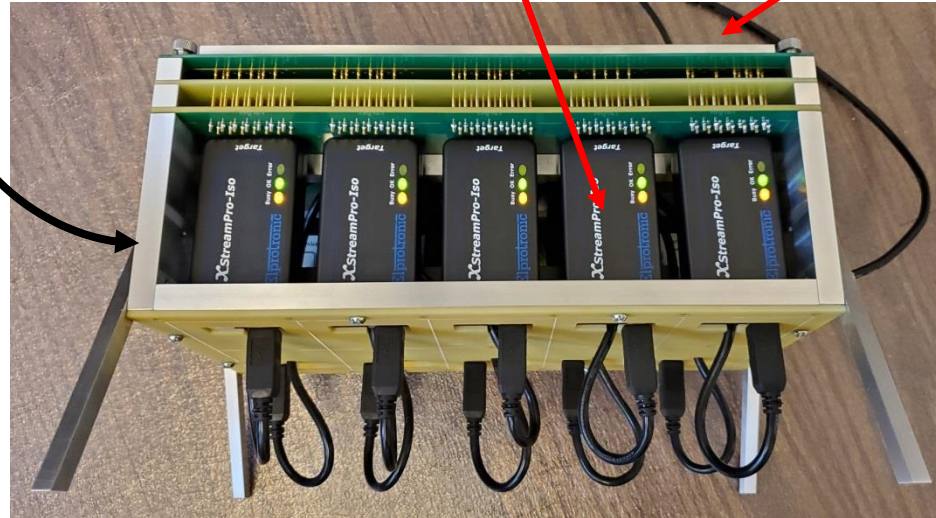


14-wires ribbon cable

FPA

Target Device

Via USB HUB

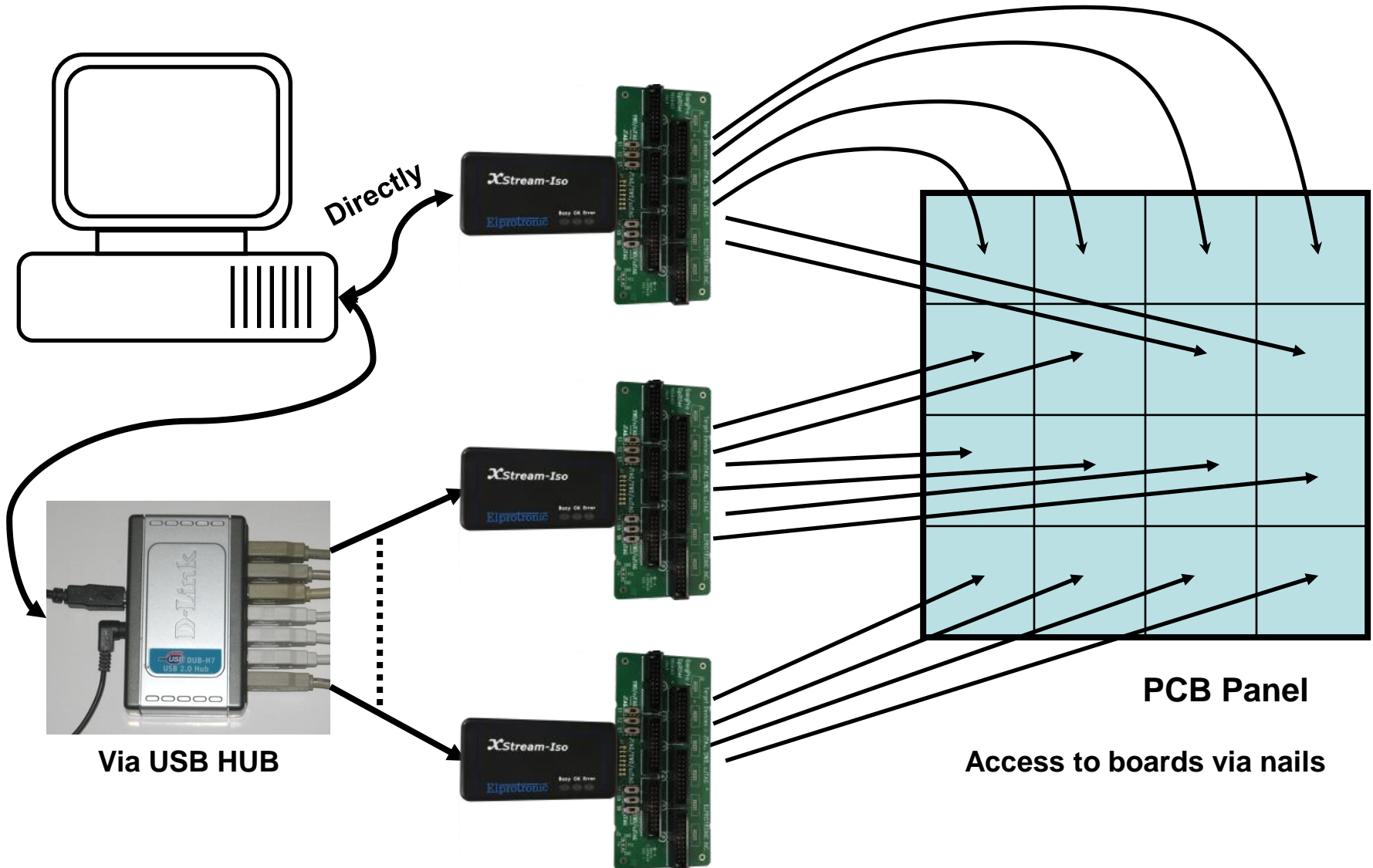


Up to 64 FPAs to one PC



# Gang Programmer

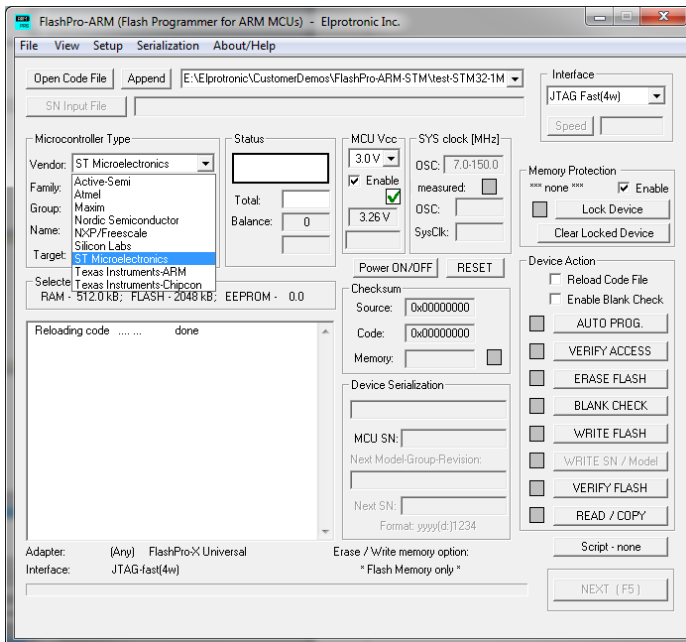
Multiple Targets: Each FPA programs up to 6 targets. Up to 384 target devices in panel can be programmed simultaneously



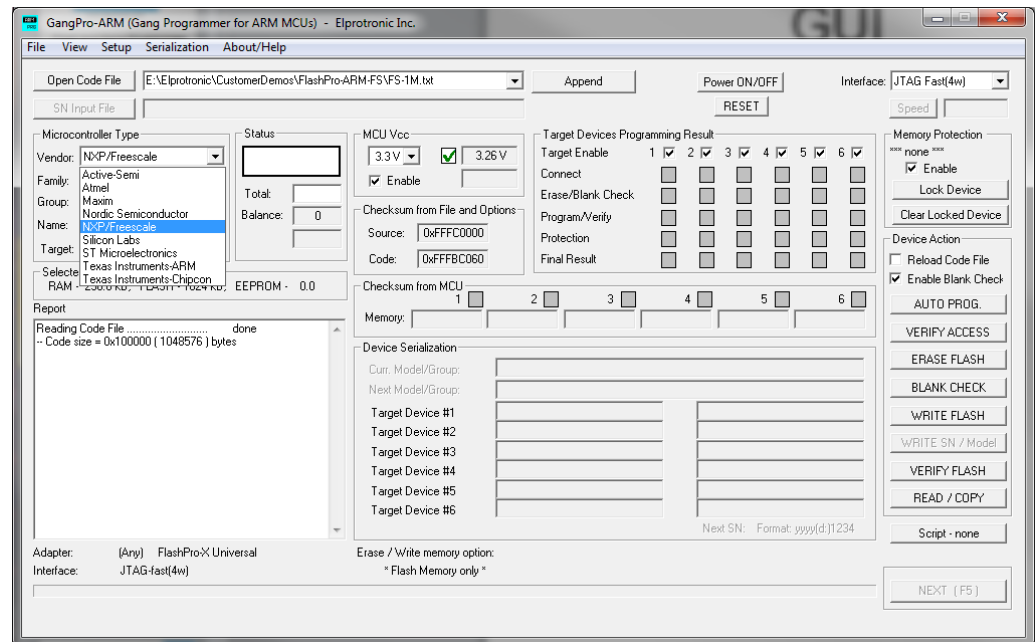
# GUI – Main Screen

- \* Software package contains ready to use GUI for FlashPro-xx and GangPro-xx.
- \* One GUI controls one adapter only.
- \* Easy to use setup, serialization, MCU protection and more.

## FlashPro-ARM GUI



## GangPro-ARM GUI



# GUI - Serialization

**Serialization Setup**

ENABLE Serialization

Remove code contents in the location where the serialization and model are defined

Serial Numbers' Output Filename (store used serial numbers):

**BarCode Scanner**

ENABLE Terminator Character

Start AUTOPROGRAM following BarCode scan

**Serial Number Format**

**Display Format**

YYYY-1234(5)  
 YYMM-1234(5)  
 YYMMDD-1234  
 YYDD-1234(5)  
 12345678  
 1234(5)  
 Custom  char (4..256)  
 from File

**In Memory Format**

HEX (MSB First)  
 HEX (MSW First)  
 HEX (LSW/LSB First)  
 BCD  
 Ascii

**Memory Location**

SN Start Address in Memory:

Used size:  bytes

Warn if Device's Flash Memory is not empty on the SN location

Serial Number (date excluded) starting from:  Radix  Decimal  Hex

Serial Number Increment:

**Model / Group / Revision**

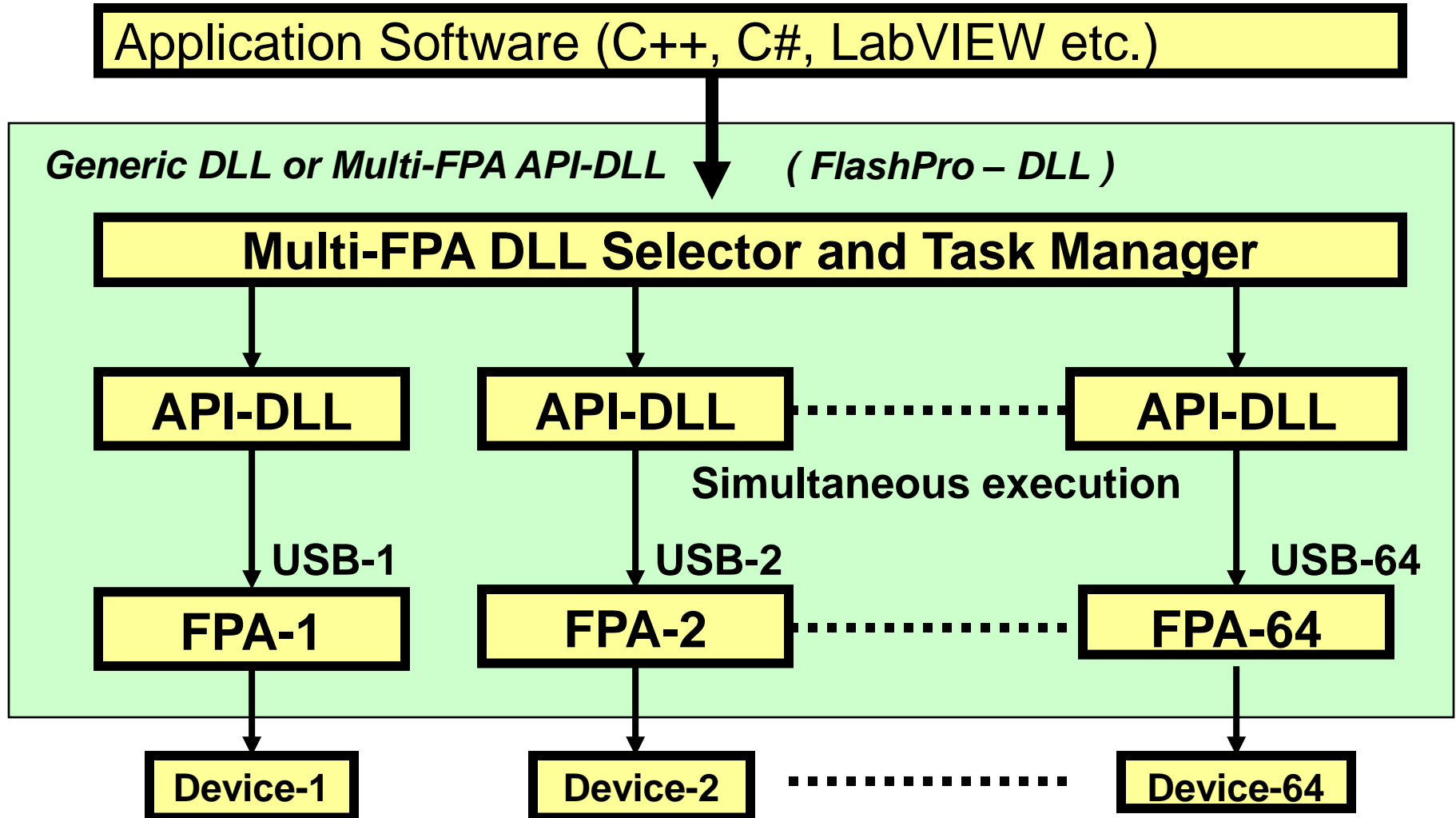
ENABLE Text size in Bytes:  (2..32) (even number)

Start Address in Memory:

- 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

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



# Control all FPAs using one DLL via Application

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

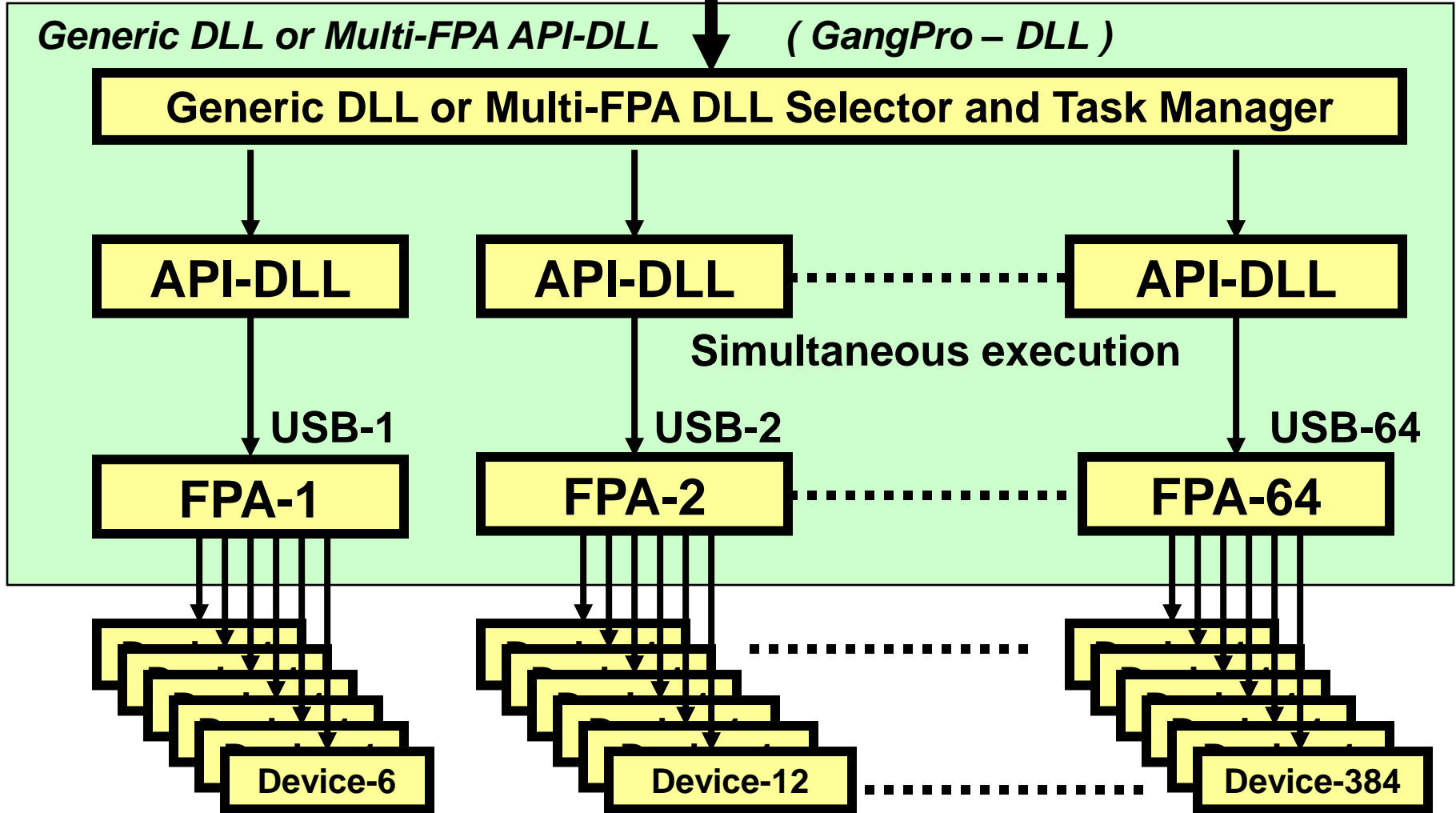
FPA-2

FPA-64

Device-6

Device-12

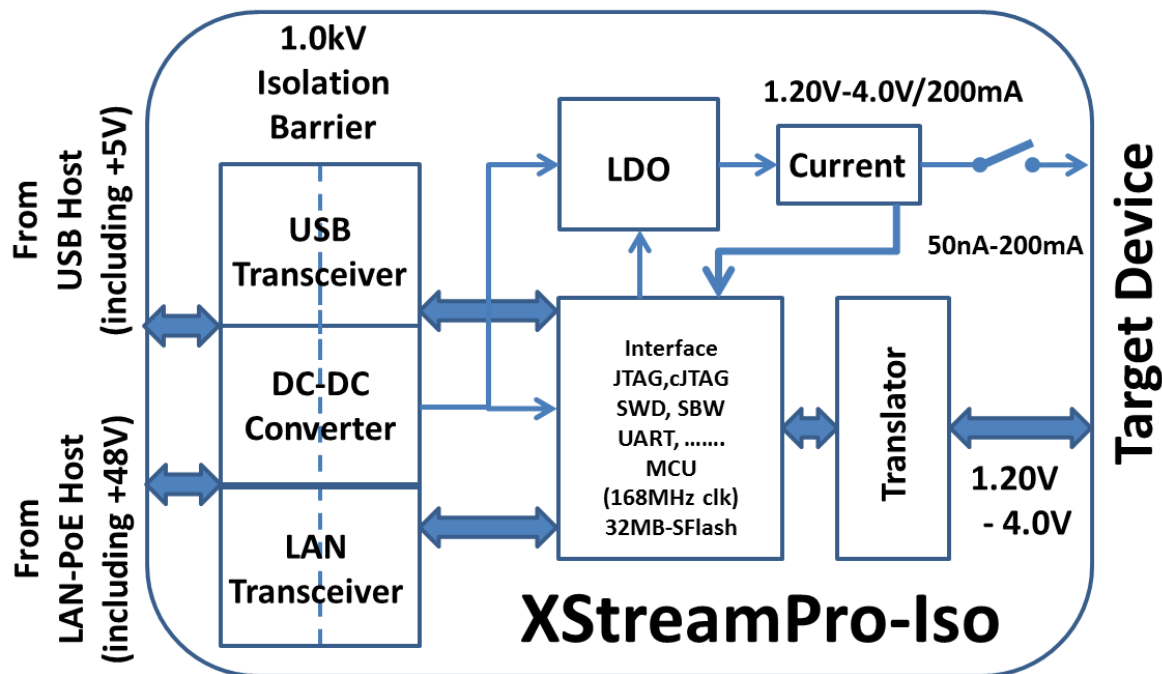
Device-384



# XStreamPro-Iso Programming Adapter

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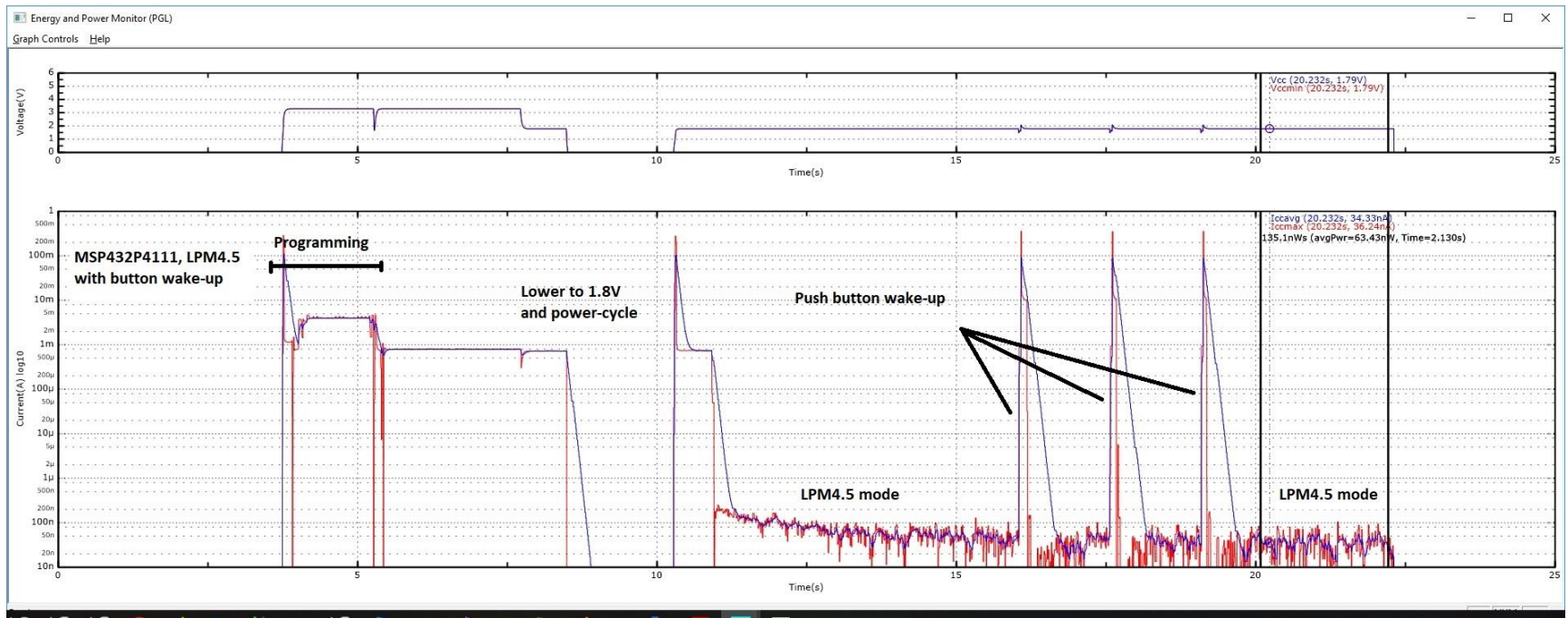


## Features:

- 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

**NEW**

# 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



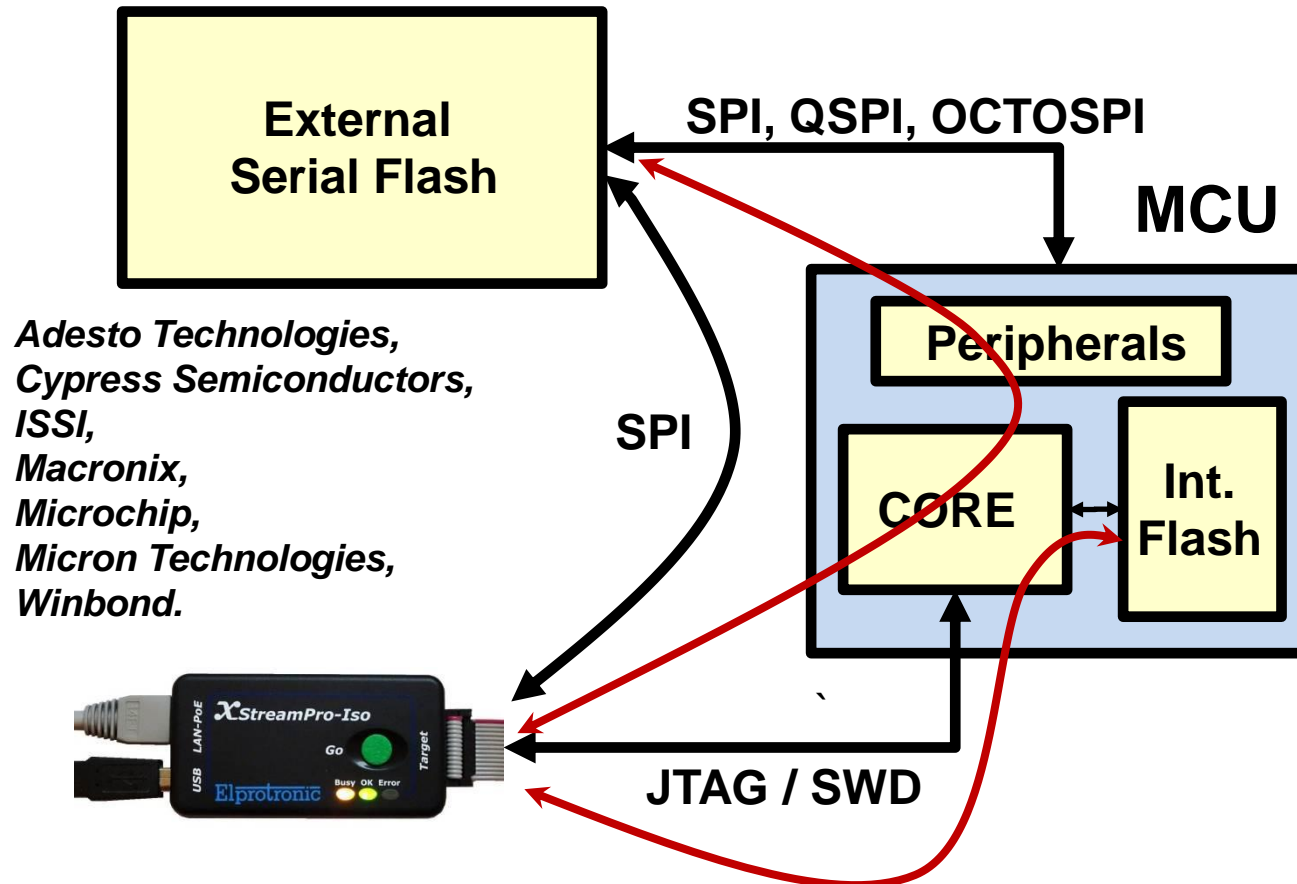
# XStreamPro-Iso Programming Adapter



## Features:

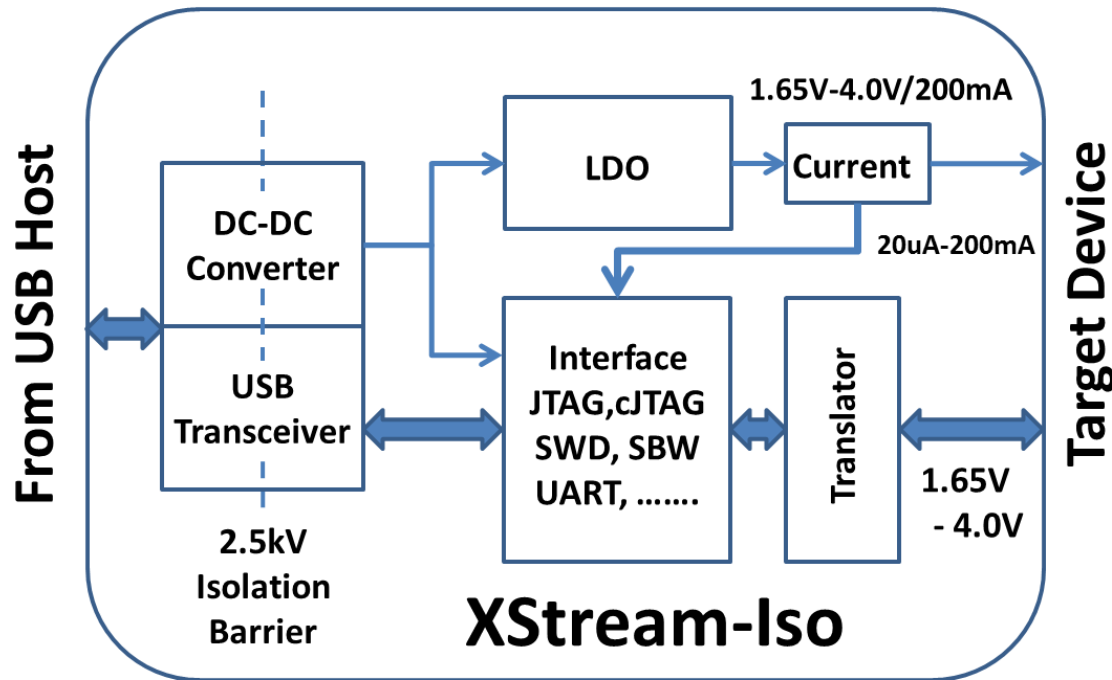
- Standalone programming feature (code and configuration in internal flash. Auto Program with GO button).
- Up to 96 distinct images, or 24 MB total in size.
- Images support production quota (maximum units programmed per image).
- Images support serialization features.
- Configurable GO feature: from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

# XStreamPro-Iso Programming Adapter



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

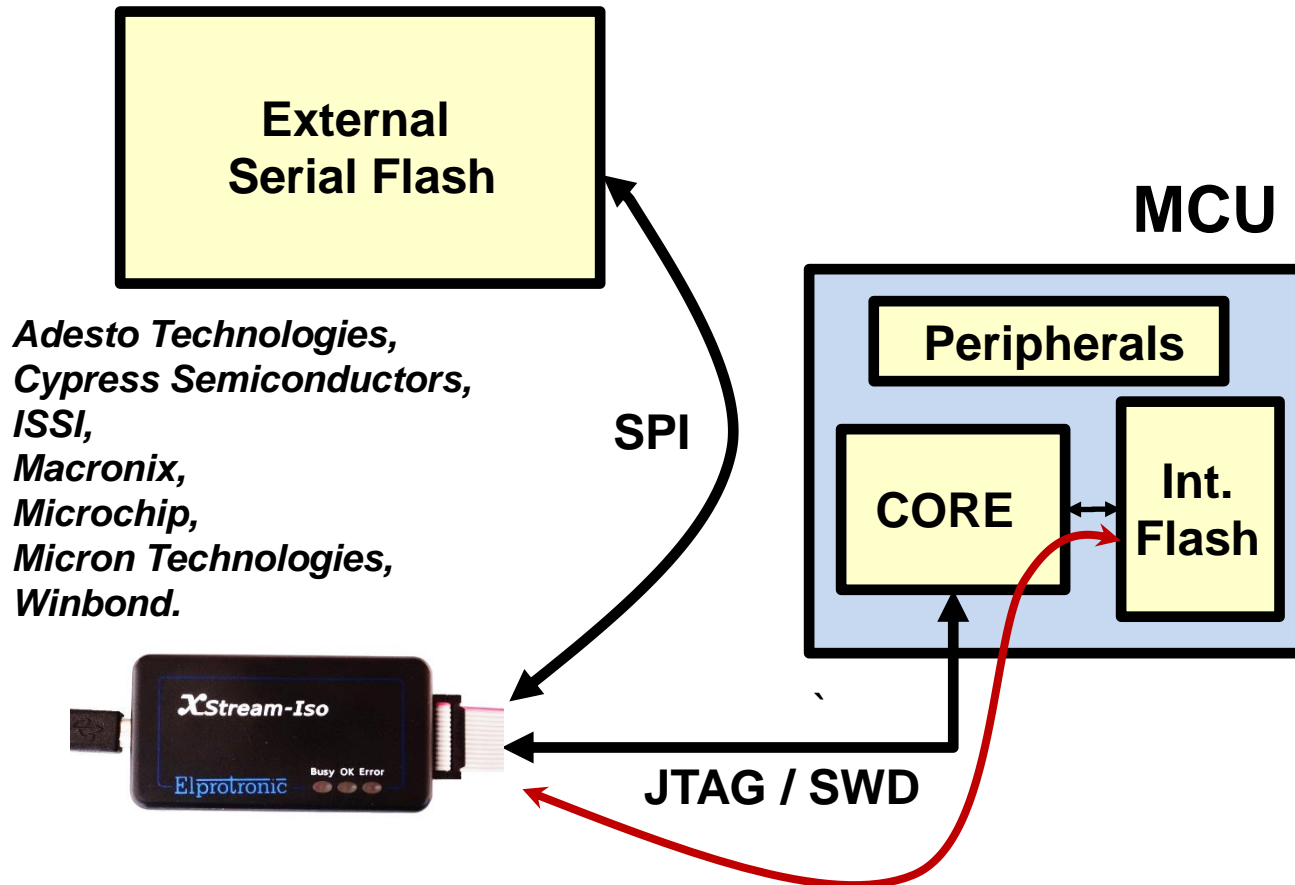
# XStream-Iso Programming Adapter



## Features:

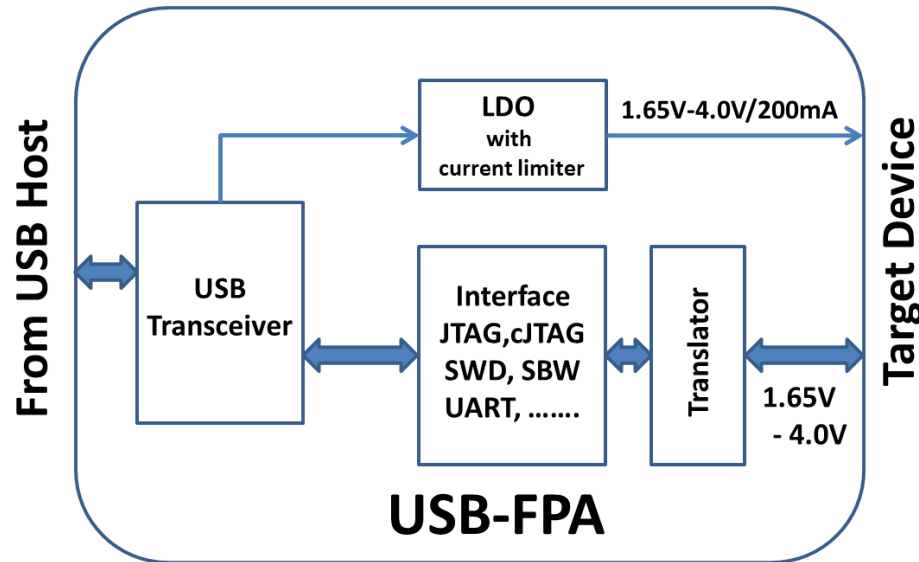
- Data transfer up to 1 Mbytes/s
- JTAG/SWD speed up to 20 MHz
- Galvanic Isolation 2.5 kV
- Vcc: 1.65 – 4.0 V, current up to 200 mA
- Current measurements 20uA – 500 mA
- Up to 64 adapters can be connected to one PC
- Size 79 \* 42 \* 21 mm
- Software compatible with the old USB-FPA (FlashPro430, FlashPro-ARM.....)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

# XStream-Iso Programming Adapter



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

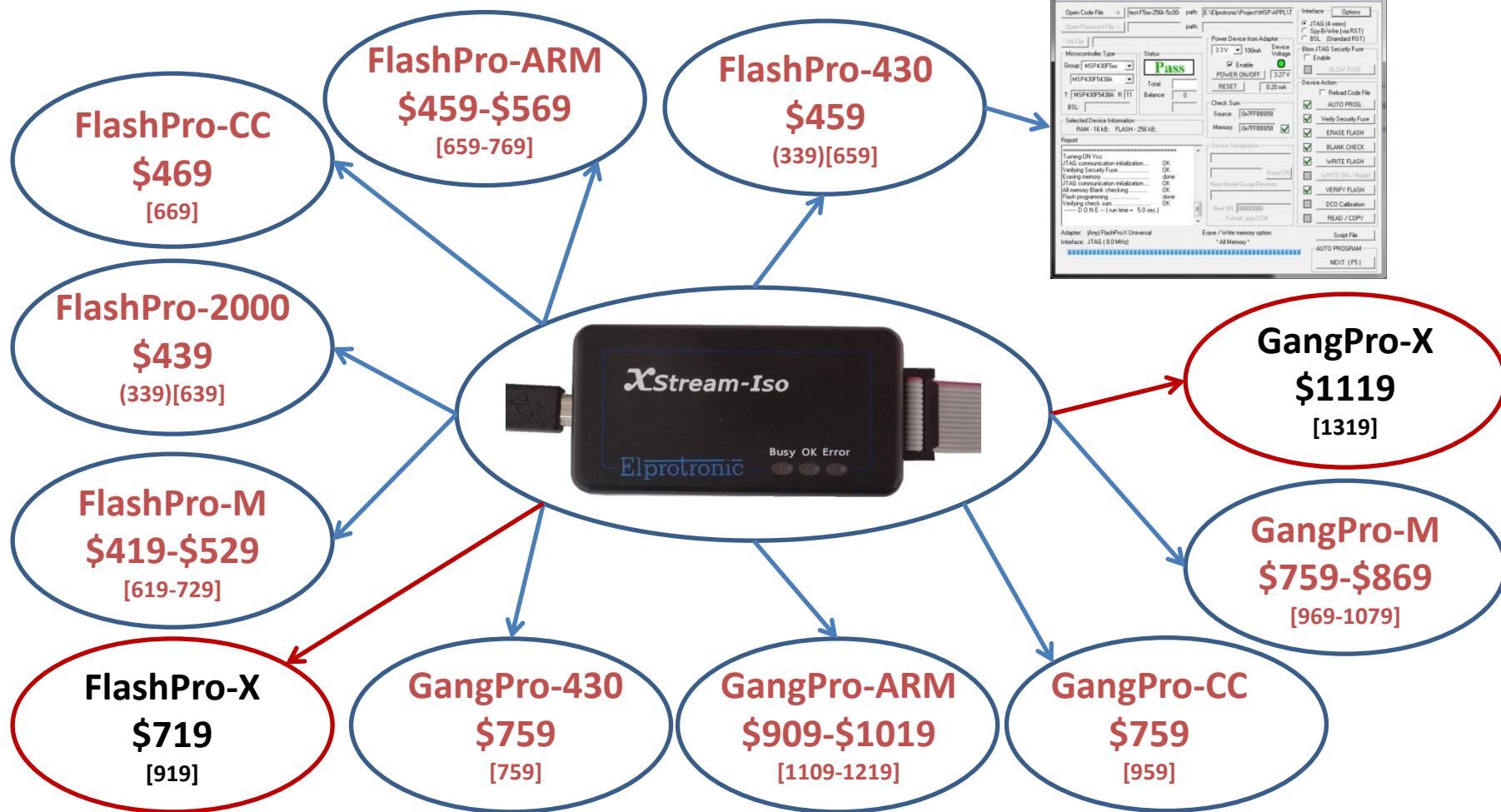
# USB-FPA Programming Adapter



## Features:

- Data transfer up to 50 kbytes/s
- JTAG speed up to 4 MHz. SWD speed up to 1.5 MHz
- Vcc: 1.65 – 4.0 V, current up to 200 mA
- Up to 64 adapters can be connected to one PC
- Size 79 \* 42 \* 21 mm
- FCC / CE test certification

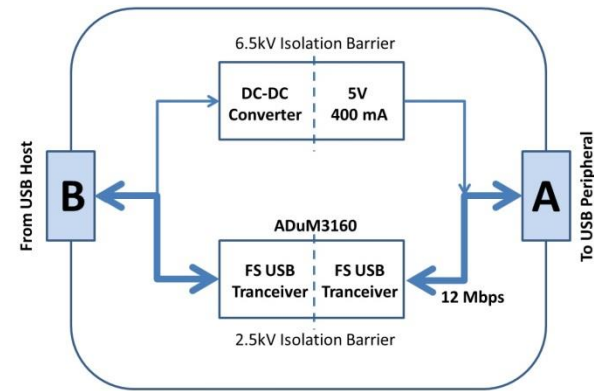
# XStream-Iso Package



**Note:** Price of package with **USB-FPA** adapter is **(\$120)** lower than with **XStream-Iso**.  
Price of package with **XStreamPro-Iso** adapter is **[\$200]** higher than with **XStream-Iso**.

# 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

