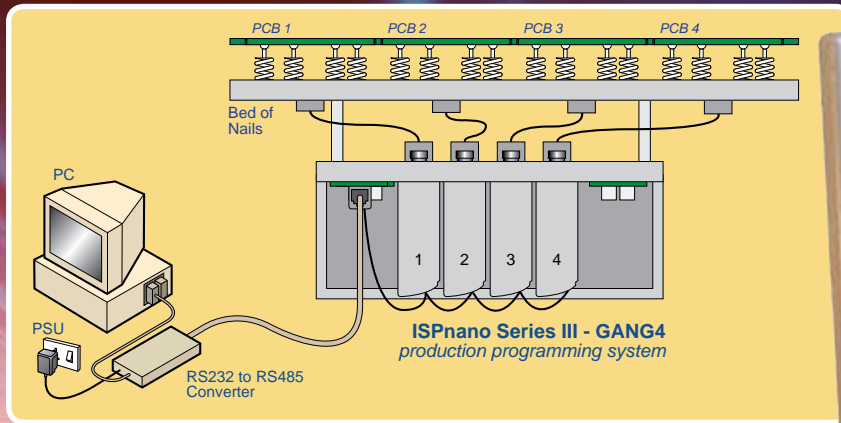


# ISP nano gang

## Multi-channel Gang Production Concurrent / Parallel Programming System



The 'ISPnano Series 3 - GANG' programming systems offer a very high-speed In-System Programming (ISP) solution capable of concurrent (in parallel) programming of up to 32 Target Boards. Each Device Under Test (DUT) is connected to a completely independent ISPnano programmer which ensures the fastest possible programming times for multi-PCB panels. Independent powering and programming of each DUT means that a problem on one DUT does not affect any of the other DUTs.

- True concurrent (parallel) programming - each Target Board (DUT) is programmed by an independent programmer
- Available as pre-configured 2 / 4 / 6 / 8 channel concurrent (parallel) programming systems
- Scalable programming solution - GANG systems can be daisy-chained up to a maximum of 32 concurrent programming channels
- Ideal for programming multi-PCB panels
- Independent power control of each Target Board (DUT) ensures trouble-free programming even if there are short-circuits on some DUTs
- Synchronised 'Standalone Programming Mode' possible for all programmers - triggered by 'Fixture lid switch'
- Simple and quick programmer replacement possible



PRODUCTION PROGRAMMING

MULTI-CHANNEL PROGRAMMING

SCALEABLE SOLUTION

STANDALONE PROGRAMMING

FIRMWARE UPGRADEABLE



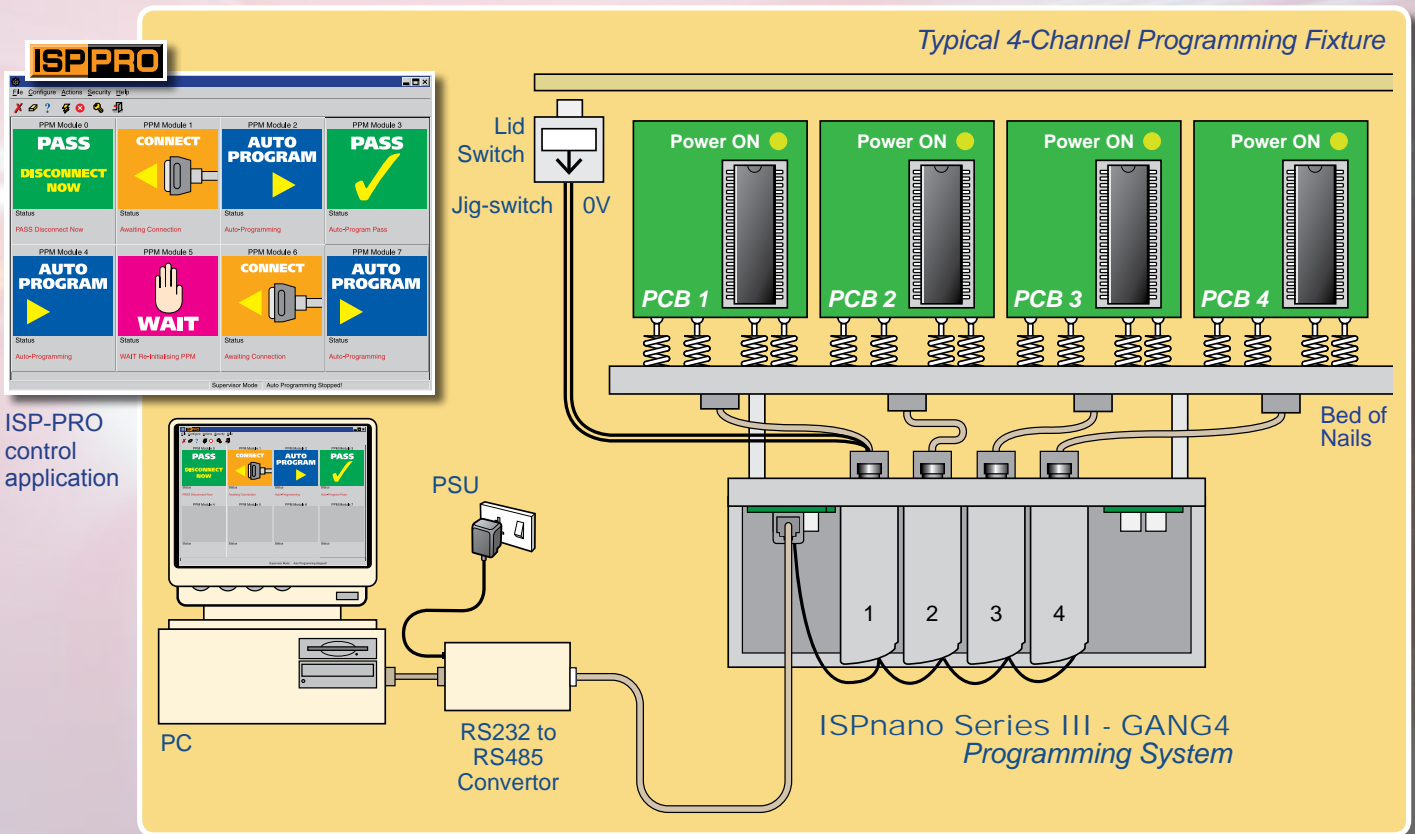
The Embedded Solutions Company

# ISP nango

Multi-Channel Gang Production ISP Programming Systems

## Scaleable gang programming system...

The 'ISPnano GANG' programming system has been specially designed for mass-production programming of either individual PCBs (DUTs) or 'multi-PCB Panels'. The system features a completely independent 'ISPnano Series III' programming module connected to each Target system (DUT) to be programmed and is scalable from 1 to 32 programming channels by simply daisy-chaining the required number of programmers via an RS485 network.



## True concurrent (GANG) programming...

The 'ISPnano GANG' programming system supports true concurrent (GANG) programming of up to 32 PCBs (DUTs) at the same time. The system can operate in either Synchronous or Asynchronous programming modes...

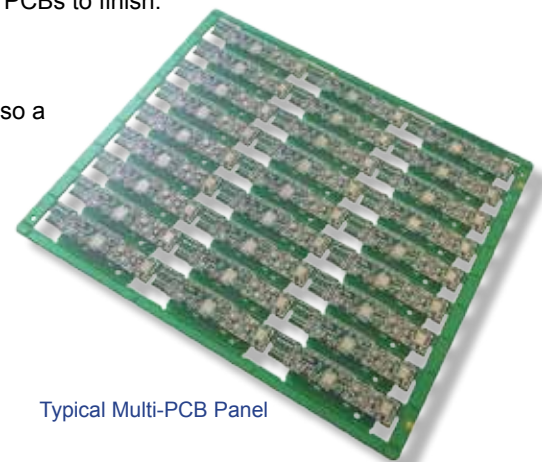
- Synchronous programming - When the programming fixture lid is closed, all programmers will immediately commence programming. This mode is ideal for programming multiple PCBs on a 'Multi-PCB Panel'.
- Asynchronous programming - This mode allows PCBs to be randomly connected / disconnected from the programmers. It is ideal for manual operator programming where individual PCBs can be disconnected as soon as the programming operation completes. Failed PCBs can be disconnected immediately instead of waiting for all PCBs to finish.

## Independent power control per DUT...

All DUT power and programming signals are completely isolated from all other DUTs, so a fault on one DUT e.g. a short-circuit or signal issue will not affect programming of the other DUTs. Independent power control per DUT also ensures that any power supply fault is localised to a single programming channel.

## Typical applications...

- Medium to high-throughput production programming (ISP)
- Multi-PCB panel programming (concurrent programming of up to 32 PCBs)
- Production Test / Programming fixtures



Typical Multi-PCB Panel

\* DUT = Device Under Test



# ISP nano

## Series III

### Programming Module for the ISP nano GANG programming systems

The ISP nano Series III is a state-of-the-art ISP Programming Module designed for high-speed In-System Programming (ISP) of FLASH Microcontrollers and Serial Memory devices in a production environment.

Its compact size and abundance of programming ports makes it ideal for integration into any Programming / Test Fixture or ATE System. It supports programming of devices by most interfaces including SPI, JTAG, JTAG chain, XMEGA PDI, ATtiny TPI, SCI, I2C (2-wire) and UART Boot Loader. The fastest possible programming times are guaranteed due to a combination of highly optimised algorithms, local storage of Project Data and high slew rate Line Driver Circuitry.

- **High-speed In-System Programming (ISP) designed for high-throughput production environments**
- **Wide ranging Device Support capability**  
- microcontrollers / serial memory devices / sensors etc
- **Compact physical size ideal for integration into ATE / Test Fixtures**  
- Designed to mount directly under the bed-of-nails in a fixture
- **Comprehensive ESD and over-voltage protection on all programmer I/O pins and programmer communication ports**
- **Scaleable parallel programming solution**  
- Network up to 32 programmers for multi-channel concurrent programming of multiple PCBs on a PCB panel

### Programming Interfaces:

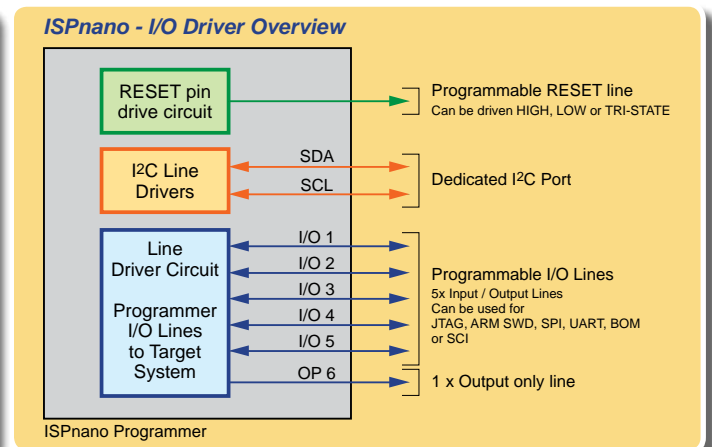
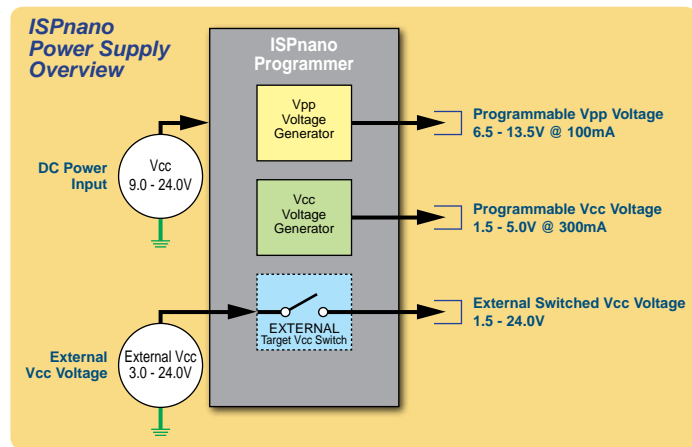
- Supports most ISP hardware interfaces / protocols including JTAG, ARM SWD, SPI, I2C, XMEGA AVR PDI, ATtiny AVR TPI, ATtiny AVR HV mode, 8051 UART Bootloader, ams 1-wire, ams UART
- Dedicated 2-wire I2C serial port
- Dedicated 2-wire XMEGA PDI / ATtiny TPI serial interface port
- Very fast programming speeds suitable for high-throughput production environments
- Individually configurable programmer I/O pins
- All programmer I/O lines are fully **ESD** and over-voltage protected
- Supports programming of target ICs between 1.8 and 5.0V.
- Programmable frequency generator output on SCK2 pin - supports external clocking of AVR microcontrollers to speed up programming

### Power control:

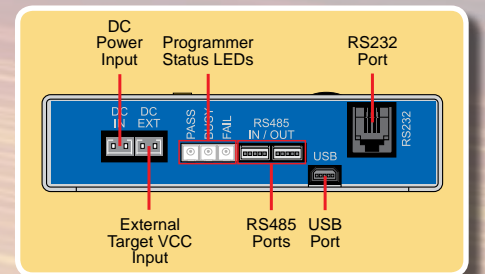
- Programmable Target VCC Supply: 1.8V - 5.0V @ 480 mA
- Programmable Target VPP Supply: 6.5V - 13.5V @ 100mA
- Programmer controlled 'Target Discharge Circuit'
- Target voltage and current monitored by programmer
- Target Board short-circuit monitoring
- Programmer controlled 'External VCC switch' (1.8 to 24.0V)
- Power supply input: 9.0 to 24.0V



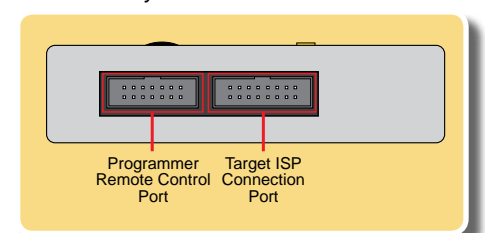
### Simple replacement of Programming Modules



Front Panel Layout



Rear Panel Layout



# Control Methods

The 'ISPnano GANG' programming systems can be configured to operate in either 'Standalone Mode' (no PC connection) or 'PC controlled' mode. A comprehensive range of PC control options are available including ISP-PRO, ActiveX and ConsoleEDS. The available Control Methods are detailed below...



## Standalone Mode ●

In 'Standalone Mode' the programmers operate without PC control (after initial configuration). The trigger to commence programming can be via one of the following mechanisms:

- 'Fixture lid switch' - When the fixture lid closes, all programmers automatically start.
- 'Automatic Target Load Sensing' function - programmer detects when DUT is connected



## ISP-PRO ■

The 'ISP-PRO - Production ISP Monitoring Application' is a powerful standalone control application which can control up to 32 x ISPnano programmers at the same time. It supports both synchronous and asynchronous multi-channel programming via a simple to use graphical user interface. ISP-PRO also features comprehensive data logging to a 'Factory Database'.



## ActiveX ■

An 'ActiveX control' is available which supports direct control of ISPnano multi-channel programming systems. This control can be integrated into any compatible Windows application allowing custom control applications to be developed by an experienced software developer.



## ConsoleEDS ■

ConsoleEDS is a simple yet very powerful 'console application' which supports both low-level and high-level control of ISPnano multi-channel programming systems. It is simple to interface ConsoleEDS to any compatible Windows application or it can be executed directly from the Command Line or from a Batch File.

- Key:**
- - Standard feature. The standalone functions are configured using the EQTools programmer configuration software.
  - - Chargeable software upgrade. A 'Software Development Kit (SDK)' is required for the first programmer in the system and then a 'run-time license' is required for all subsequent programmers.

## ISPnano GANG programmer range

The 'ISPnano Series 3 - GANG' programming systems are available as pre-configured 2 / 4 / 6 / 8 channel concurrent (parallel) programming systems



ISPnano-S3-GANG2-RACK



ISPnano-S3-GANG4-RACK



ISPnano-S3-GANG6-RACK



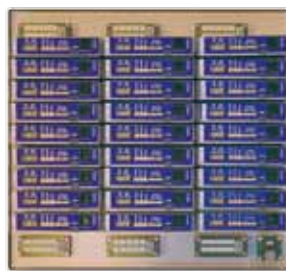
ISPnano-S3-GANG8-RACK

Customised 'GANG Programming Systems' with any number of channels can be manufactured to special order.

Example  
27-channel  
system



Front



Rear

This 27-channel gang programming system comprises 27 programmers arranged in a compact 9 x 3 matrix. It is designed to be mounted directly underneath the bed-of-nails platen inside a programming fixture. It is capable of programming 27 x DUTs concurrently yielding a 20 second programming time for the entire panel of 27 PCB's (AT91SAM7S512 microcontroller via JTAG interface).

### Ordering information:

ISPnano-S3-GANGx-RACK - x channel GANG Production ISP Programming System (Rack)

Where x represents the number of programming channels (2 / 4 / 6 / 8 channels)

Please note: If the programming system is to be PC controlled, then the relevant control SDK and run-time licenses must also be ordered.

ISPnano-S3 - Spare 'ISPnano Series III' programming module only  
RS485-C2(UN) - RS485 converter module for use with GANG programming systems

Device Support Libraries

The 'Device Support Libraries' must be purchased for each programmer separately. Please contact Equinox for an up-to-date list of all available 'Device Support Libraries'.

Equinox Technologies reserves the right to change any information contained within this leaflet without prior notice. E&OE



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