

# DediProg ® Company Presentation “Race100 Serial Flash Gang Programmer”



March 2010

# A Market Needs

- **Market Weakness:**

Serial Flash High densities proliferation has evidenced a Gang Programmer Weakness in the Market: Universal Programmers are not adapted for SPI Flash Memories.

- **Root cause:**

To be universal, each different signals and power must be multiplexed on each pins which may limits the performances due to delays and high capacitance reducing the timing guard bands. Performances of Universal Gang Programmer are limited and even risky.

# DediProg Solution

By Dedicating its Gang Programmers, DediProg is able to optimize and offer the best possible solution on the market.

**Race100** is a Serial Flash Gang Programmer designed for high speed and high volume Serial Flash programming. Optimized for the SPI Flash, the Race100 is in average:

**8 times faster** than the Universal Programmers in the market  
**+ 4 times more sockets** for parallelism (High densities)

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**= 32 times Higher Throughput**

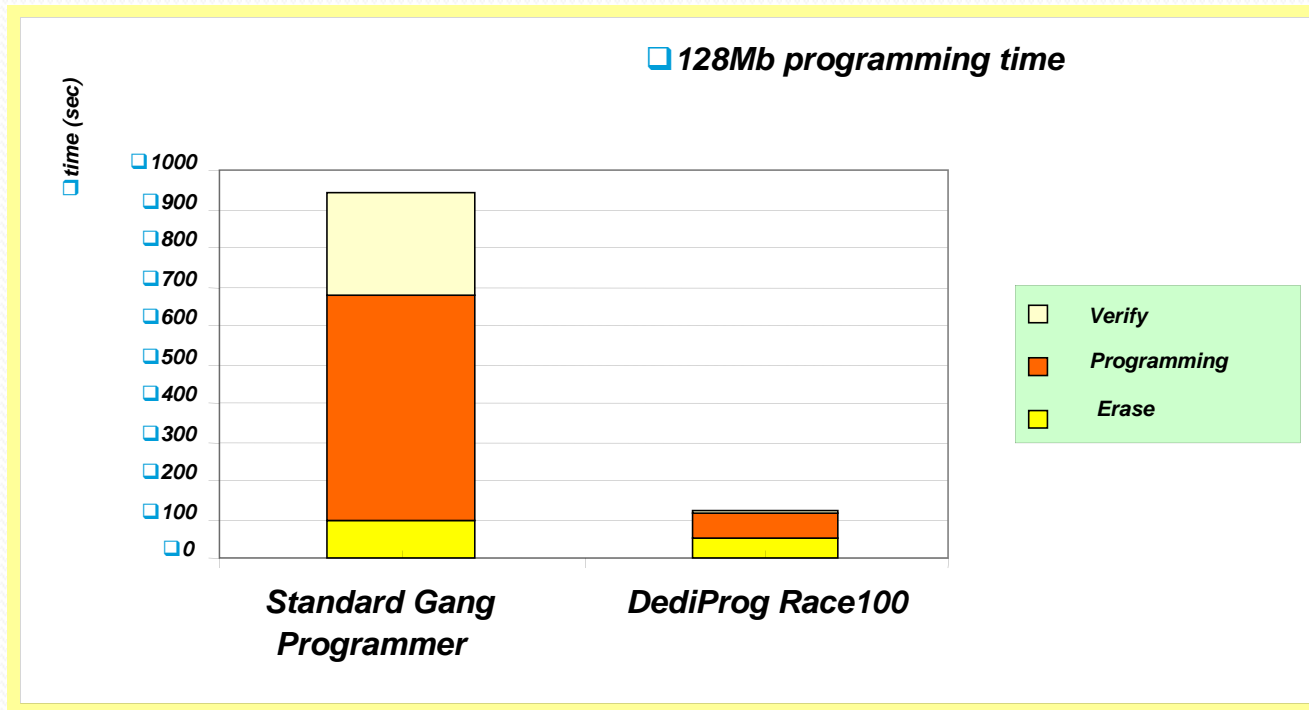
**= 20 to 40% of cost reduction for programming service**

## **Conclusion:**

If you have significant volume of serial Flash to be programmed,  
**The Race100 is your solution**

# Performances

Comparison of Erasing, programming and Verify performances on 128Mb



The Highest performances offered in the industry:

Serial Flash densities	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb
Program + Verify	0.6s	1s	2s	3s	8s	15s	16s	75s

# Throughput

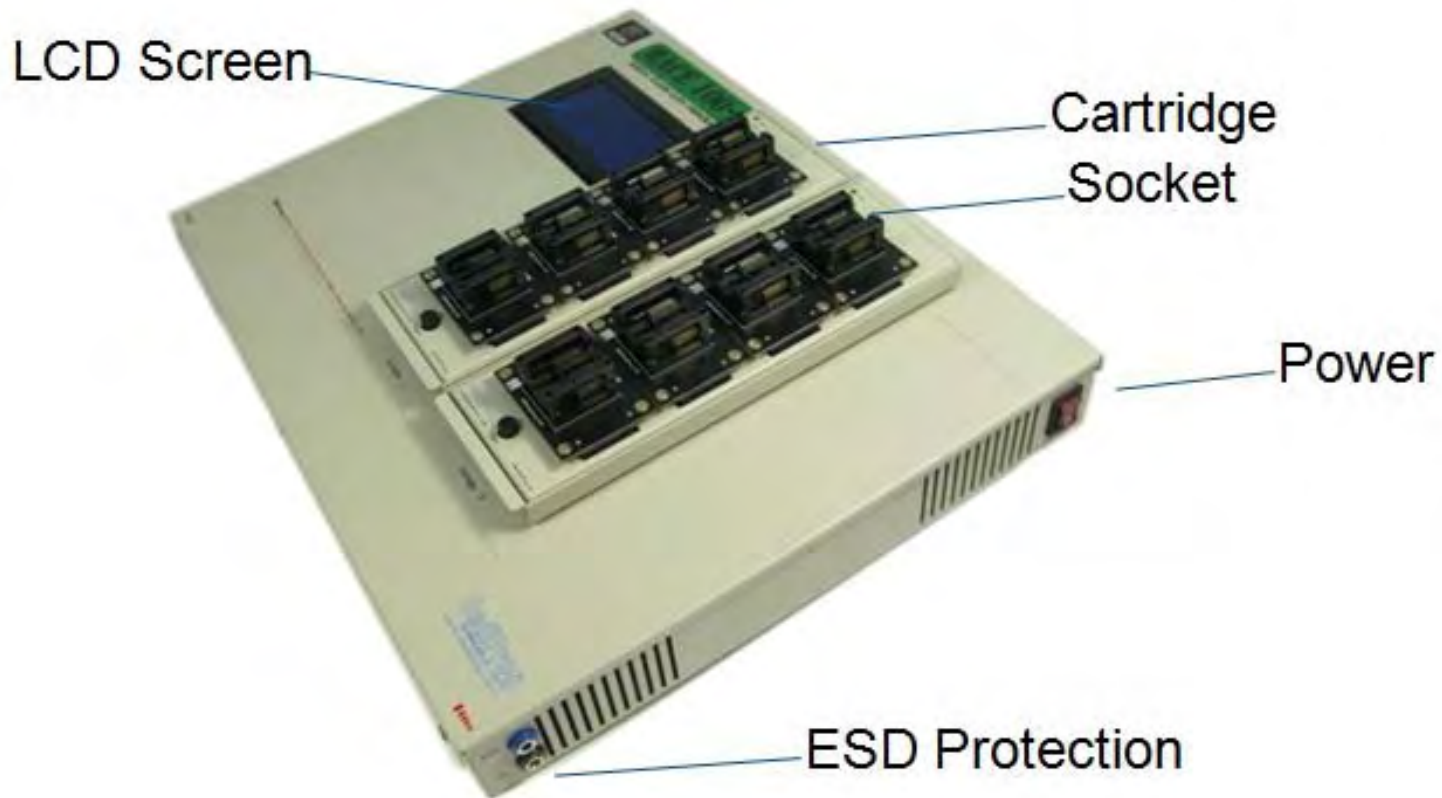
## Throughput comparison with manual Handling (Handling time = 4 sec)

	128Mb		64Mb		32Mb		16Mb	
	Standard Gang	Race100	Standard Gang	Race100	Standard Gang	Race100	Standard Gang	Race100
Performances P + V (s)	850	75	420	15	130	12	80	7
Sockets	4	20	4	20 or 8	4	20 or 8	4	20 or 8
<b>Throughput By Hours</b>	<b>17</b>	<b>900</b>	<b>34</b>	<b>900</b>	<b>110</b>	<b>900</b>	<b>180</b>	<b>900</b>

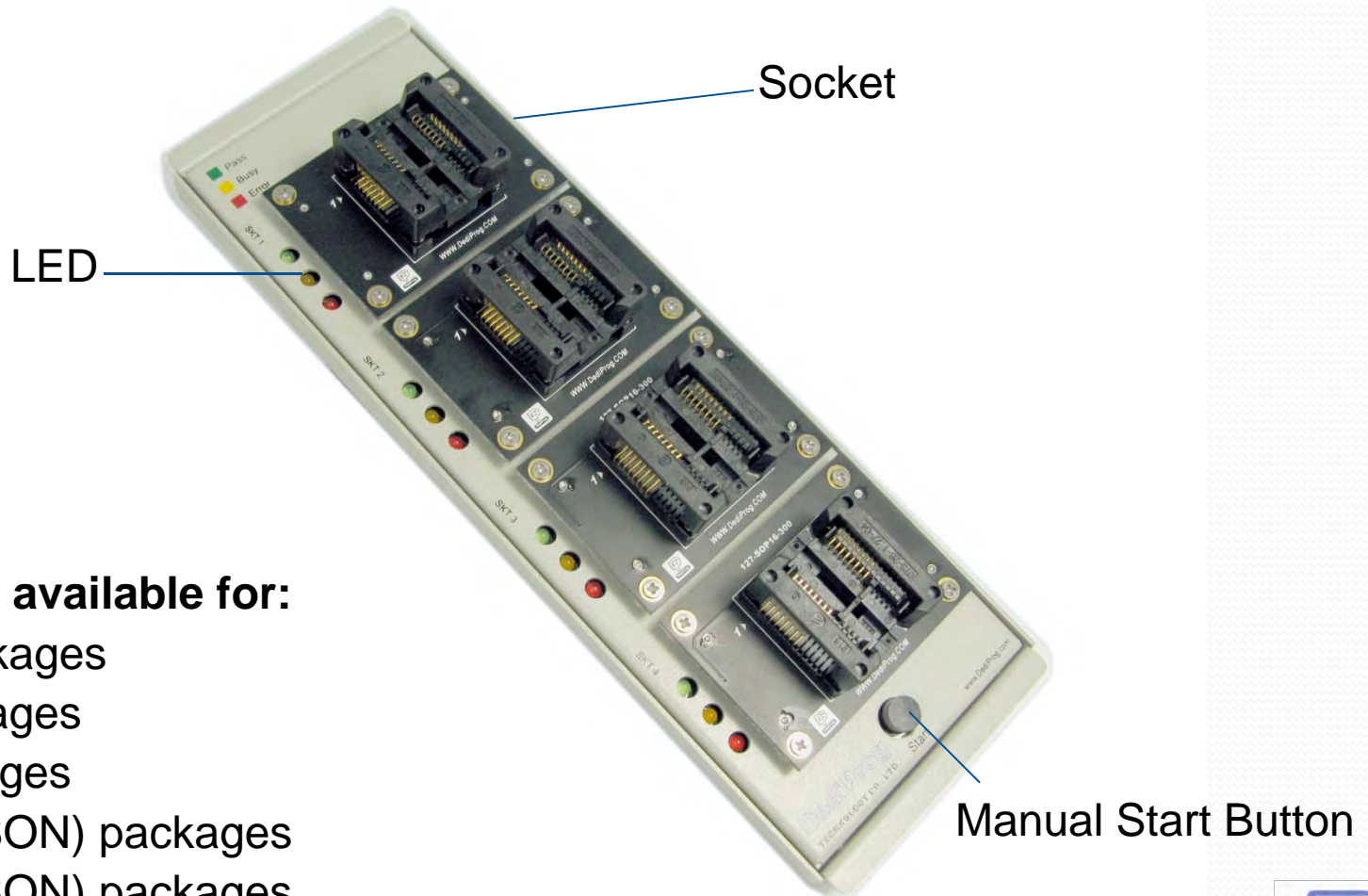
## Throughput comparison with Automatic Handler (Handling time neglected)

	128Mb		64Mb		32Mb		16Mb	
	Standard Gang	Race100	Standard Gang	Race100	Standard Gang	Race100	Standard Gang	Race100
Performances P + V (s)	850	75	420	15	130	12	80	7
Sockets	4	20	4	20	4	20	4	20
<b>Throughput By Hours</b>	<b>17</b>	<b>960</b>	<b>34</b>	<b>4.8K</b>	<b>110</b>	<b>6K</b>	<b>180</b>	<b>10K</b>

# Description Gang: Race100-S8



# Description of Cartridge



## Cartridges are available for:

- SO16W packages
- SO8W packages
- SO8N packages
- MLP5\*6 (WSON) packages
- MLP6\*8 (WSON) packages

# Two Models

To fulfill the different requirements coming from the low densities and High densities Serial Flash, Race100 comes with two models:

- **Race100-S16** up to 4 Cartridges with 4 sockets each (16 sockets)
- **Race100-S8** up to 2 Cartridges with 4 sockets each (8 Sockets)
- **Race100-S4** up to 1 Cartridges with 4 sockets each (4 Sockets)

The model must be select so that the operator can work continuously in loop on the sockets without wasting any time.

# Working Modes

## **Three Advanced Working Modes:**

**“Auto Socket Start” Mode:** Each socket works independently, detects automatically the memory when inserted and start the operations instantly according to the project definition.

➔ This mode ensures the best throughput.

**“Auto Cartridge Start” Mode:** Sockets of the same cartridge work as a group. Operations will auto start when all chips are inserted to the 4 sockets of a cartridge.

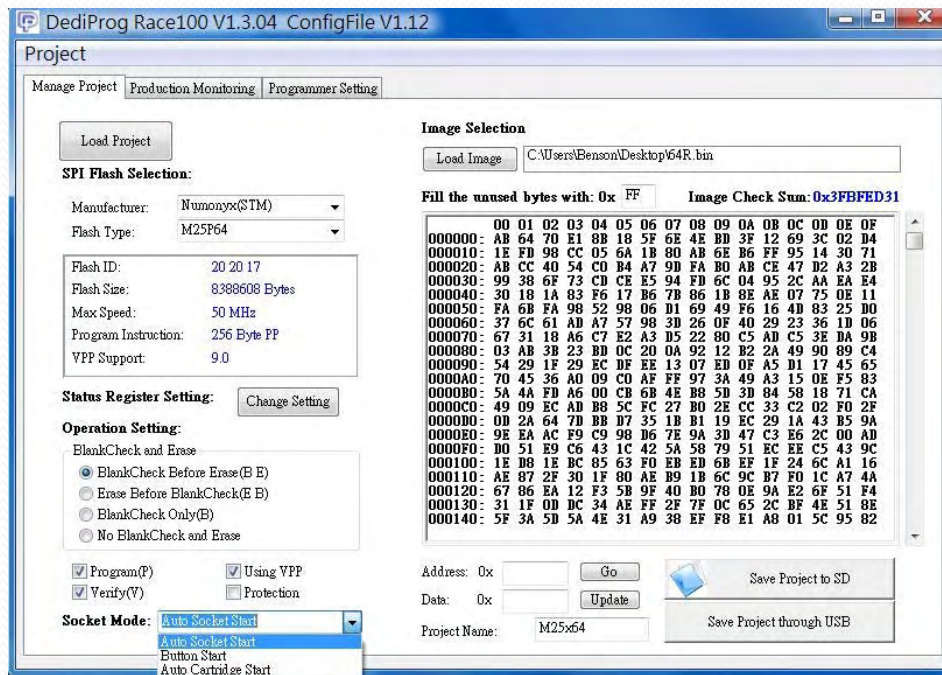
**“Button Start” Mode:** Sockets of the same cartridge work as a group. Operator has to press the “Start Button” of the Cartridge to start the operations on all the sockets.

➔ This mode reduces the risk of operator manual mistake on the working sockets.



# Projects Management

- Project created on Computer:
  - Code Image
  - Target memories
  - Operations definitions
- Project Loaded on SD Card
- Project selected on Gang Programmer from the SD Card
- Production information saved on SD card



# Real Time Information

Real time information on the project on going:

- On Gang LCD display
- On PC Monitor

The screenshot shows the 'Project' window of the DediProg Race100 V1.3.04 ConfigFile V1.12 software. The window has three tabs: 'Manage Project', 'Production Monitoring', and 'Programmer Setting'. The 'Production Monitoring' tab is active, displaying real-time project data.

**Log Window**  
**Save Report**  
**Stop Project**

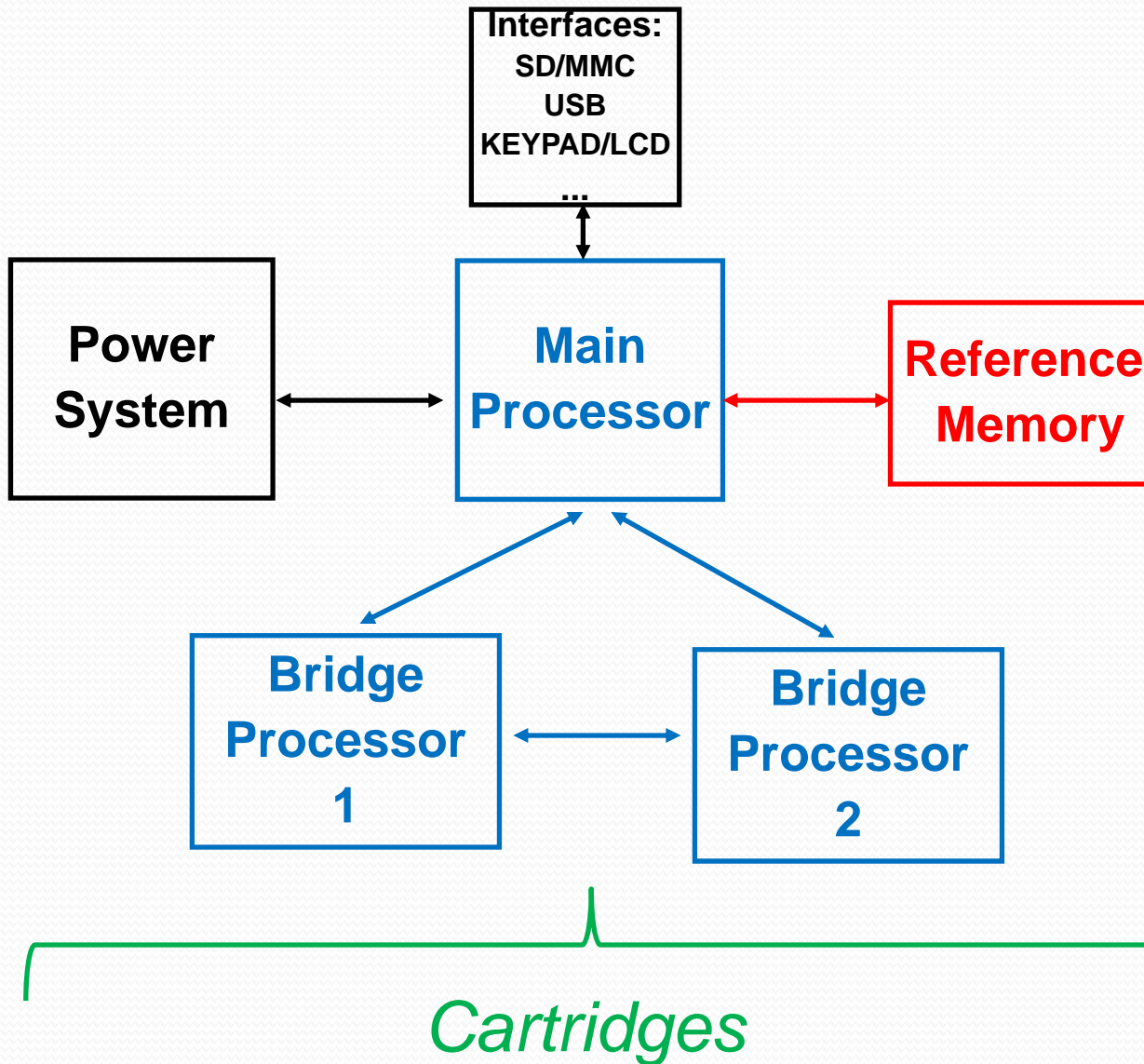
Project Name: M25x64  
Project Setting: BE P V H  
Flash Name: M25P64  
Project Starts @ 21-09-26 20:56  
Project Ends @  
Operation Mode: Auto Socket Mode  
Firmware Version: 3.1.2

**Total Pass: 0**  
**Total Fail: 0**  
**USB: connected**

Cartridge1	Cartridge2	Cartridge3	Cartridge4	Cartridge5
Socket 1065	Socket 946	Socket	Socket	Socket
Pass 0	Pass 0	Pass	Pass	Pass
Fail 0	Fail 0	Fail	Fail	Fail
PassRate ---	PassRate ---	PassRate	PassRate	PassRate
Socket 1059	Socket 947	Socket	Socket	Socket
Pass 0	Pass 0	Pass	Pass	Pass
Fail 0	Fail 0	Fail	Fail	Fail
PassRate ---	PassRate ---	PassRate	PassRate	PassRate
Socket 1058	Socket 949	Socket	Socket	Socket
Pass 0	Pass 0	Pass	Pass	Pass
Fail 0	Fail 0	Fail	Fail	Fail
PassRate ---	PassRate ---	PassRate	PassRate	PassRate
Socket 1052	Socket 944	Socket	Socket	Socket
Pass 0	Pass 0	Pass	Pass	Pass
Fail 0	Fail 0	Fail	Fail	Fail
PassRate ---	PassRate ---	PassRate	PassRate	PassRate



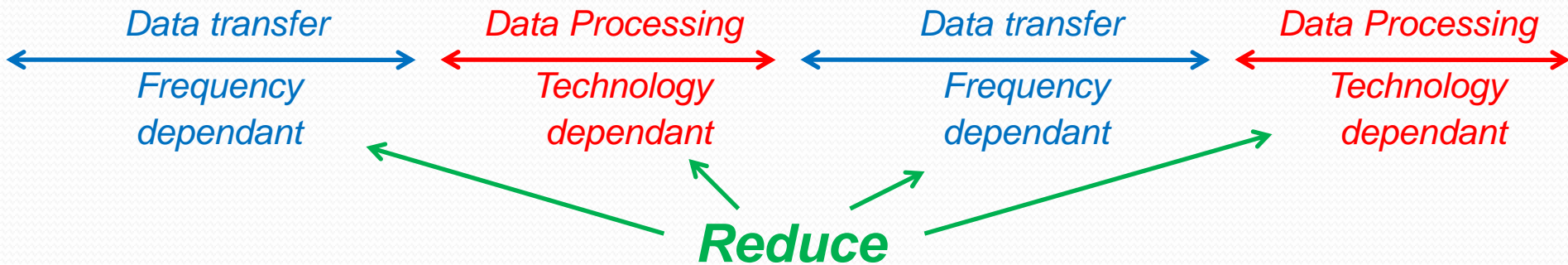
# Race100 Architecture



# DediProg Architecture: Benefits

**Tri-Processors** architecture combined with our **Viper technology** for data processing ensure the shortest delay between packets in the industry:

- Shortest Programming time with the lowest frequency for safer Timing Guard Band



**20MHz:**  $T/2=25ns$ ,  $T_{clqv}=8ns$ , Processor Data setup time= 2ns

→ Timing Guard band = 15ns

**33MHz:**  $T/2=15ns$ ,  $T_{clqv}=8ns$ , Processor Data setup time= 2ns

→ Timing Guard band = 5ns

} Safer

# Designed for Quality, Reliability and Robustness

## Hardware:

- Dedicated for serial Flash: fixed pins assignment (no multiplexing, no added delay, no added capacitance)
- Dedicated power supply for each socket
- Dedicated over-current protection for each socket
- Dedicated control unit for each socket
- Optimized signal path
- Auto Diagnostics (Self power test, Leakage current test, Voltage test, continuity test, Wrong insertion detection..)
- Protection (Inrush current, overload current, over load Voltage, ESD..)

## Firmware:

- CRC value calculated in the PC software when generating project file
- Data checking during project loading
- Dedicated CRC checking besides bit to bit comparison during verification

# Quality Chain

- Logics components own purchasing: ensure sourcing quality
- MSL compliancy before soldering
- ICT test in manufacturing (short cut, continuity test, Voltage level test, Vil, Vih under load, leakage current test..)
- ESD compliancy before and during assembly
- FCT Test in DediProg (Functional)
- Bake Test with auto cycling algorithm (45c)
- Early failure test in customer conditions (operator handling):
  - 5000 parts with double verify (another programmer)
  - 5000 parts with self verify