



## *Digital SCR Power Controllers*

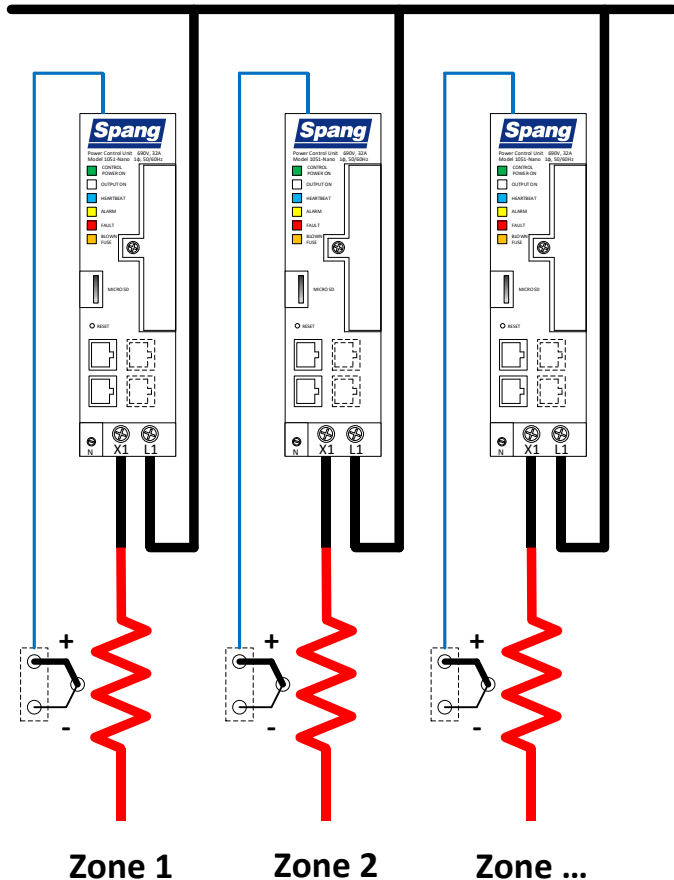
### *1050 Nano Series*



## Features

### Direct Temperature Control

The 1050 Nano Series includes two (2) thermocouple inputs for single or multi-thermocouple temperature control loops. Standard temperature setpoint control and Recipe Mode features provide options for a variety of customer applications. **Recipe Mode** is an automatic control process using programmable ramp and soak stages typically for preheat conditions or batch applications. The integrated temperature controller eliminates the need for external temperature control devices, auxiliary components, and wiring thus reducing system complexity, installation time, on-hand spare parts, and cost.



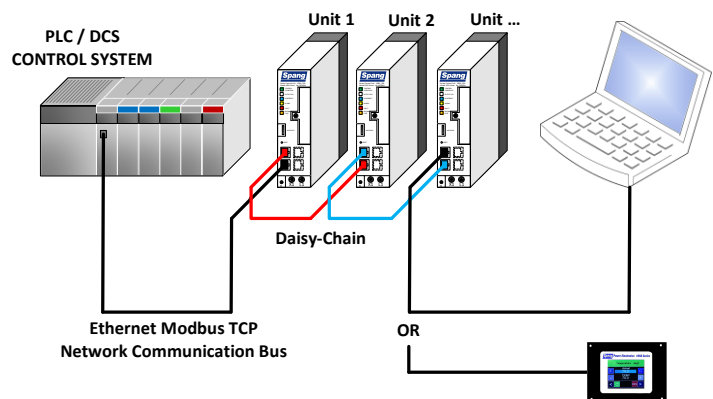
### Network Communications

With integrated and optional network ports, the 1050 Nano can connect to an **industrial network** thus providing control and monitoring over a high-speed communication platform. Control settings, faults & alarms, and real-time operating conditions can deliver valuable information to the end user. The network interface options include communication over:

- Profinet
- Ethernet/IP
- Ethernet Modbus TCP (\*)
- EtherCAT

(\*) Ethernet Modbus TCP is available as a standard (integrated into the base product) or additionally through an optional, expanded network interface card.

In addition to the industrial network features, the 1050 Nano Series **Daisy-chain** capability utilizes two (2) onboard Ethernet ports for fast, multi-unit setup and configuration; helping to reduce system installation time and cost. One to one connections and direct wired displays are also valid configurations.



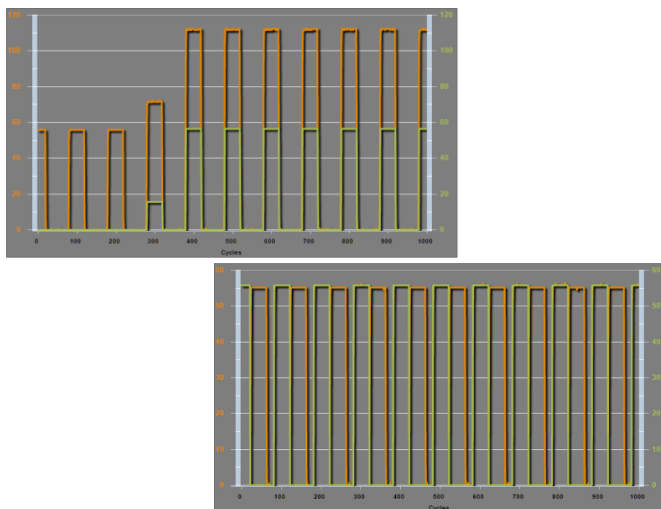
### Configurability

Spang's web-browser based **Configuration Tool** is hosted and served by the power controller itself via an on-board micro-SD card and does not require the user to download software to a PC. The Configuration Tool can be used for initial setup to alter any of the standard factory settings, for real-time monitoring, or for process troubleshooting. Configurable settings exist to meet a variety of application needs; ratings and limits, firing modes, control and regulation modes, fault & alarm levels, etc. Standard / configurable analog and digital I/O also exists to help the 1050 Nano integrate within more historically traditional control systems.

## Energy Efficiency

The 1050 Nano features Spang's **Active Sync** algorithms built directly into the software. There are many known benefits to firing the SCR's in zero-cross mode, allowing clean AC cycles to pass to the load and producing good power factor. However, if many units fire (turn on) at the same time, the peak draw on the distribution / source could be higher than it needs to be during a given period and therefore, could result in a higher utility charge depending on how a local municipality charges. By implementing the **Active Sync** feature, the controllers actively communicate with one another via peer-to-peer signals and intelligently shift the timing at which they fire in order to reduce overlap – thus reducing the peak demand on the source while still maintaining the customer's control requirements. Depending on the process operating points, monthly cost savings on the utility bill can translate to repeat value month after month.

**General reference (2-zones): Source peak demand reduced from  $\approx 110\text{kW}$  when overlapped to  $\approx 55\text{kW}$ .**

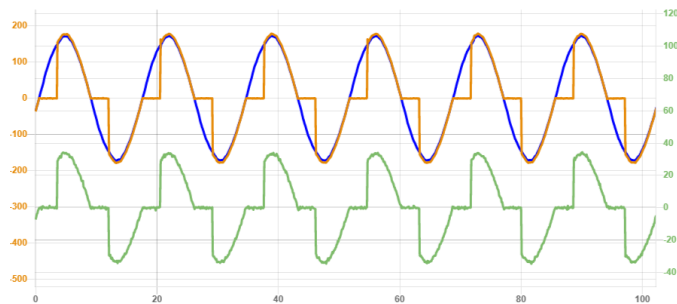


## Small Footprint

The 1050 Nano controller can mount directly on a DIN rail via the heatsink clip or be secured directly to a back panel.  $I^2T$  semiconductor fusing is integrated within the touch-safe package and does not require additional panel space in the system design. Side-by-side bookshelf-style mounting is acceptable and helps to minimize the overall panel space requirements.

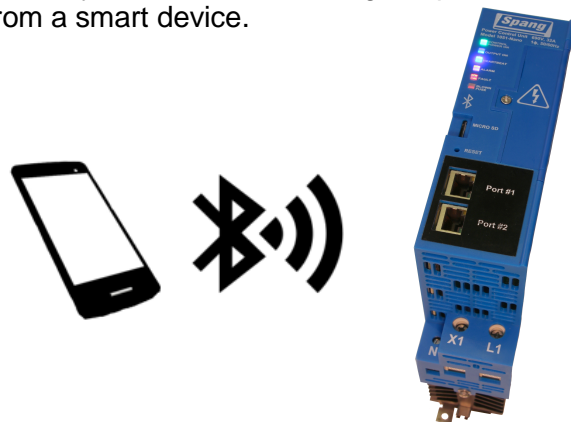
## Advanced Diagnostics

The 1050 Nano has built-in **oscilloscope** and **trend** apps within the configuration tool allowing for more advanced troubleshooting and process monitoring. The oscilloscope function will also automatically record and save waveshapes under select fault conditions, providing a snapshot in time of what happened leading up to an event.



## Bluetooth Communications

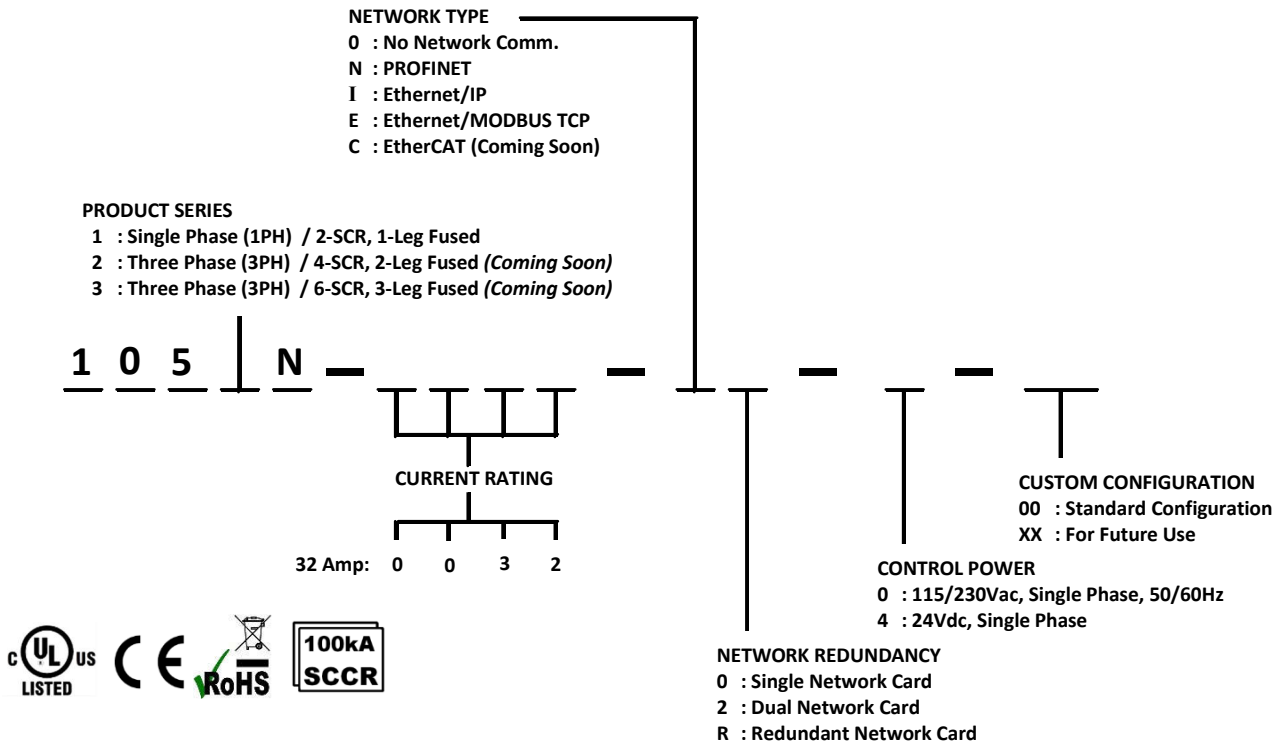
The power controller's real-time run data becomes available in read only format over **Bluetooth** or an established wireless network while using Spang's monitoring app for IOS or Android to communicate to the 1050 Nano. Keep the enclosure door closed and stay safe while monitoring the performance from a smart device.



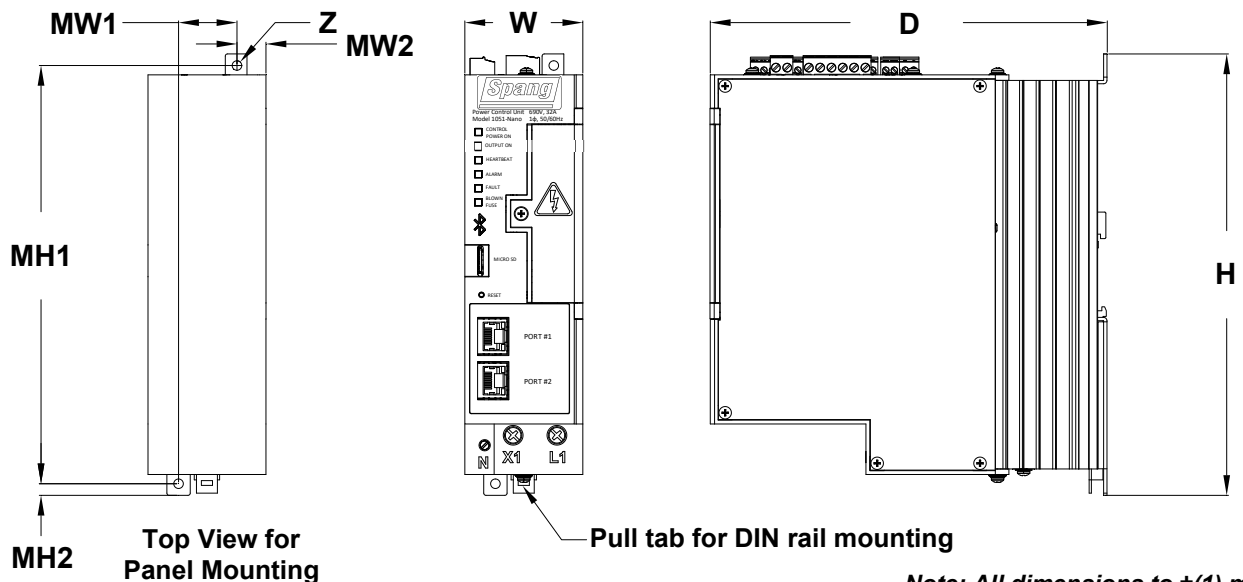
## Integrated $I^2T$ Fusing

The integrated, touch-safe, and fast-acting  $I^2T$  semiconductor fusing has been 3<sup>rd</sup> party tested to provide a 100kA SCCR product rating. The Fuse Blown LED indicator will illuminate on the front face of the product should the fuse clear due to a fault condition. Fuse replacement is quick and easy via hinged door access on the front of the unit.

## Ordering Information



Dimension: Inches [mm]									
Product	Amperage	W	H	D	MH1	MH2	MW1	MW2	Z
1051 Nano	32A	2.09 [53.0]	7.86 [199.7]	7.03 [178.4]	7.45 [189.2]	0.21 [5.2]	1.03 [26.2]	0.51 [13.0]	Ø0.17 [Ø4.3]



# Technical Specifications

Input Voltage	50 to 600VAC – UL Rating 50 to 690VAC – IEC Rating
Input Line Frequency	50 / 60Hz
Control Power	85 to 265VAC, Single Phase, 50/60Hz OR 24Vdc, Single Phase
Output Voltage Rating	0 to 600VAC – UL Rating 0 to 690VAC – IEC Rating
Output Current Rating	See ordering information
Ambient temperature	0 to 50°C ambient
Humidity	Up to 95% non-condensing
Max Elevation	1,000 meters above sea level
Cooling	Natural convection air-cooled
Enclosure / Protection	IP20 with appropriately (user installed) power cabling
Mounting	DIN-rail or panel mounting
Control Methodology	Phase Angle Zero Cross** **Configurable for firing into the primary of a transformer and / or Active Synchronization for multi-unit installations.
Control Modes	Analog, Digital, Network Communications
Load Type	Resistive, Transformer-coupled
Regulation Modes	Voltage, Current, Power, Duty Cycle
Regulation %	± 1%
Temperature Regulation	Two (2) process thermocouple inputs; 24-bit A/D resolution (Type-B, C, E, J, K, N, R, S, or T thermocouples)
Transient Voltage Protection	RC network across SCRs (no MOV), premium rated SCRs & software enabled shutdowns.
Short Circuit Protection	Integrally mounted I2T fusing; SCCR 100kA 50/60Hz (3 <sup>rd</sup> party laboratory tested design)
Analog Control References	Two (2) configurable for: 0-20mA, 4-20mA, 0-5Vdc, 0-10Vdc, 10K potentiometer, etc.
Analog Outputs	Two (2) configurable for: 0-20mA, 4-20mA, 0-5Vdc, etc.
Digital Inputs	One (1) Enable / Inhibit & (3) Configurable Digital Inputs
Digital Outputs	Two (2) configurable form-C relay outputs with dry contacts
Digital Configuration Interface	PC Interface / Web-browser Configuration Tool, Ethernet Modbus TCP
Network Configuration	Profinet, Ethernet/IP, Ethernet Modbus TCP, and EtherCAT (coming soon)
Status Indicators (LEDs)	Control Power ON – Green Output ON – White Heartbeat – Blue Alarm – Yellow Fault – Red Blown Fuse - Amber
Digital Display (ordered separately)	Compatible with Spang color touch screen LDC display
Certifications	UL, cUL, CE, RoHS, WEEE