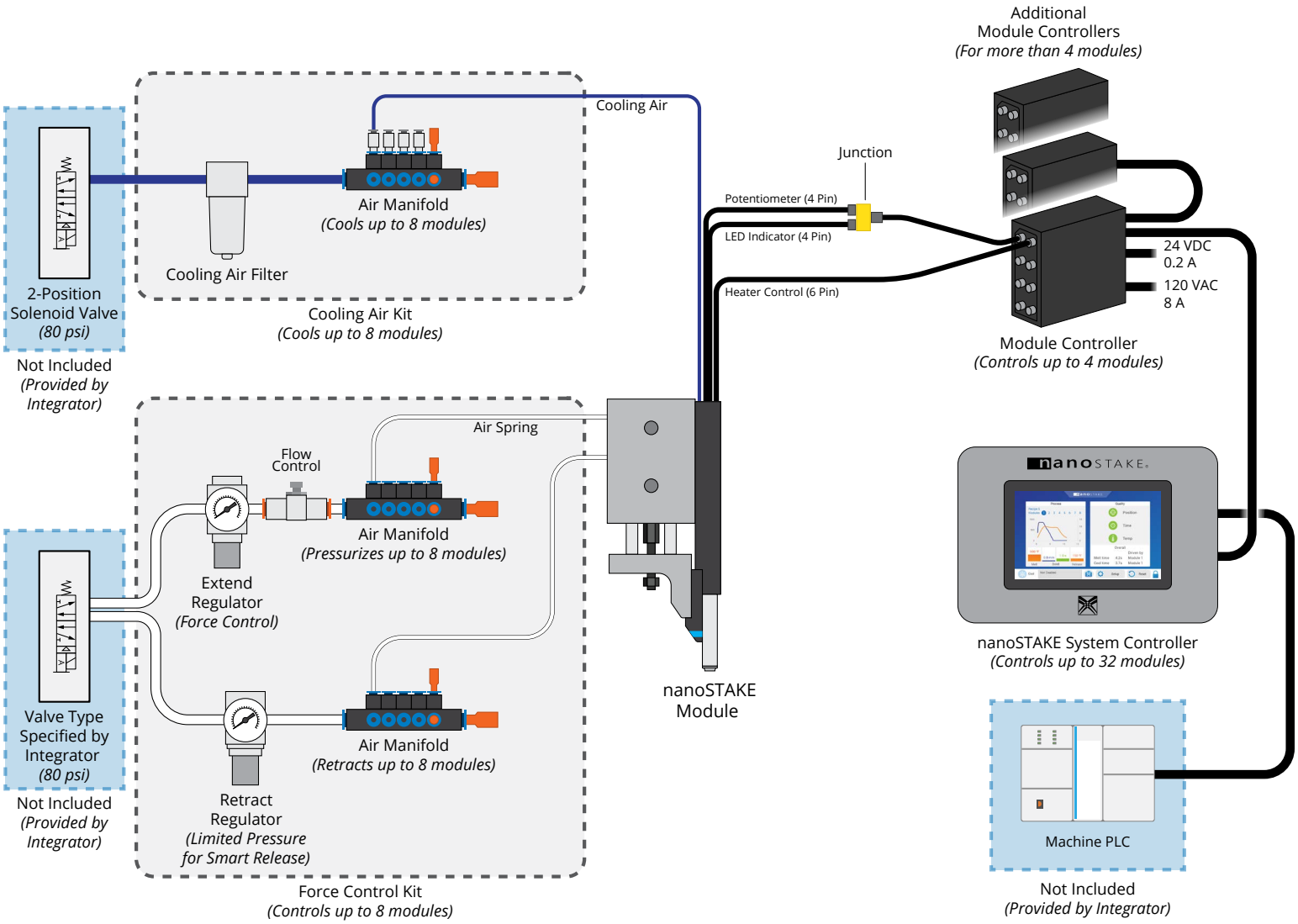
Updated: 10/03/25

Quick Start Guide

NanoSTAKE System Layout



Getting Started

1. Download the user manual.
This manual contains **required installation steps** that prevent system component failures.

Download the **nanoSTAKE user manual**.
https://bit.ly/3QQvDtw

2. Install the nanoSTAKE components.
Refer to the "System Integration" section of the manual.

- Install base modules, pneumatic components, Module Controller, and System Controller. We highly recommend mounting the System Controller on the front of the machine so it is easily accessible by the machine operator.
- Fixture the part consistently to ensure the stake points are in the same location for every machine cycle.
- Make sure you use the proper regulators for extend and retract motions.
- Decide whether to mount the Module Controller(s) on the tool plate or in the electrical panel. We recommend mounting them on the tool plate for simpler wiring and serviceabilty.

3. Wire the system.
Refer to the "Electrical Installation" section of the manual.

- Set the address dial on the Module Controllers in sequential order. See "Module Controller Addressing" for more.
- Ensure the last Module Controller has a termination resistor or switch set according to the instructions in the "System Communications" section of the manual.

4. Program the system.
Refer to the "Programming Sequence" section of the manual.

- Use the I/O Monitor in the nanoSTAKE System Controller to verify your setup.

5. Set up the nanoSTAKE process.
Refer to the "Initial Setup" section of the manual.

- Watch our nanoSTAKE process video to learn how to set up the staking process. This will prevent many common installation mistakes.
- If you purchased dataPLUS™, refer to the manual linked below.
- Call Extol Technical Specialist for process training. ***800-324-6205***
- Ensure the hard stop is set on each module to prevent them from driving into your part with too much pressure. Failing to do this will cause damage to the module.
- Configure the recipe to the appropriate number of modules for your application. See "Recipe Setup" in the manual.

Watch video tutorial of **nanoSTAKE process setup**.
youtu.be/JFT7qpOe2JI

Download the **dataPLUS user manual**.
https://bit.ly/3OGbRkS

Discrete I/O Wiring

Pin / Address	Wiring Color †	Name	Data Direction
1	Black	24 VDC COM *	
2	Brown	Input COM	
3	Red	Output COM	
4	Orange	Enable	Machine PLC → nanoSTAKE System Controller
5	Yellow	Recipe Select 1	Machine PLC → nanoSTAKE System Controller
6	Green	Recipe Select 2	Machine PLC → nanoSTAKE System Controller
7	Blue	Recipe Select 4	Machine PLC → nanoSTAKE System Controller
8	Purple	Cycle Start	Machine PLC → nanoSTAKE System Controller
9	Grey	Part Select 1	Machine PLC → nanoSTAKE System Controller
10	White	Part Select 2	Machine PLC → nanoSTAKE System Controller
11	Pink	Reset	Machine PLC → nanoSTAKE System Controller
12	Light Green	Platen Full Stroke	Machine PLC → nanoSTAKE System Controller
13	Black / White	UI Unlock	Machine PLC → nanoSTAKE System Controller
14	Brown / White	N/C	
15	Red / White	N/C	
16	Orange / White	Validation Mode	Machine PLC → nanoSTAKE System Controller
17	Green / White	Ready	nanoSTAKE System Controller → Machine PLC
18	Blue / White	Running	nanoSTAKE System Controller → Machine PLC
19	Purple / White	Cycle Complete	nanoSTAKE System Controller → Machine PLC
20	Red / Black	Fault 1	nanoSTAKE System Controller → Machine PLC
21	Orange / Black	Fault 2	nanoSTAKE System Controller → Machine PLC
22 ‡	Yellow / Black	Modules Cooling Air	nanoSTAKE System Controller → Valve
23	Green / Black	At Temp Extend	nanoSTAKE System Controller → Machine PLC
24	Grey / Black	Retract Cylinders	nanoSTAKE System Controller → Machine PLC
25	Pink / Black	24 VDC+	

‡ **Important:** Cooling air MUST BE AVAILABLE AT ALL TIMES and be controlled directly by the nanoSTAKE System Controller. It should NOT pass through the PLC except for monitoring. See the nanoSTAKE user manual for more information.

* **Important:** Both Module Controller and System Controller must use the same DC common.

† If your connector is assembled (not molded), the wiring colors are different. Please reference the nanoSTAKE User Manual.

Module LED Colors

Color	Pattern	Meaning
Blue	Solid	Cool, ready
Blue, dimmed	Solid	Cool, not enabled
Orange to Red	Gradual change	Warm to hot
Green	Solid	Cycle complete
Bright Yellow	Solid	Taring module temperature
Yellow	Solid	In validation cycle
Blue	Pulsing*	No part selections made
Red	Pulsing*	Heater or temperature fault
Yellow	Pulsing*	Position fault
Cyan	Pulsing*	Process fault
Magenta	Pulsing*	Communication error
White	Pulsing*	Invalid configuration or Module Controller fault

* A fast pulse rate indicates the module is above safe temperature and should not be handled.

Best Practices

Follow these best practices to integrate the nanoSTAKE technology successfully:

- Center the nanoSTAKE module over the boss for uniform heating and minimizing flash.
- Auto Dwell is enabled by default and automatically detects the dwell position when the module stops moving. It can be used in place of stake-by-position or stake-by-time. Please refer to the Auto Dwell video for a full explanation.

Watch video explanation of **nanoSTAKE Auto Dwell**.

youtu.be/od-W-UjEaWs

- Once a successful stake has been achieved, set the hard stop on each nanoSTAKE 1:1 cylinder.
- Implement suggested process parameters (supplied by Extol's lab or Integration Support).
- Use the factory-supplied controller process sequence.
- Set the pressure to a sufficient level using the included regulator, as referenced in the nanoSTAKE User Manual.
- Cushion the extend and retract motion of the tool plate at the end of stroke.
- Start (turn on) the nanoSTAKE process only after the nanoSTAKE modules have been supplied with cooling air.
- Verify that the cooling air pin (Pin 22) from the nanoSTAKE System Controller is directly connected to the cooling air valve (this should not be interrupted by a safety relay).
- Filter incoming cooling air to 0.01 microns and eliminate oil and water from all pneumatic lines.
- Support the part directly under each/all staking points.
- Fixture the part consistently to ensure the stake points are in the same location for every machine cycle.