

# **SS-1051-3-BD Specifications**

The SS-1051-3-BD Smart System is the most versatile of the multiple configuring units. It consists of the following modular components: (1) Atac Module, (1) 1900 Smart Trigger Module, (1) 1400 Smart Trigger Module, (1) +24 volt Power Supply and (2) Sensor Interface Modules.

## **(1) Atac Unit (15 Amps RMS Output Capacity)**

The **ATAC 1051**, Active Tuning Amplitude Controller, is a flexible, all digital controller designed to maximize the performance of vibratory feeders. In its standard mode of operation the **ATAC** controller will maintain a feeder's vibration intensity at any value specified by the user (**Amplitude Control**). In addition, the controller will continually search for the natural frequency of the feeder (**resonance**) and excite it at that frequency (**Active Tuning**). Together, Active Tuning and Amplitude Control of the **ATAC** yield:

- Consistent feeder performance over a wide range of loading conditions.
- Freedom to build and operate a feeder with any natural frequency from 40 Hz to 160 Hz.
- Feeders can operate from 50 Hz (Europe) or 60 Hz (North America) supply power without modifying the feeder springs or mass.
- Minimum coil current, Minimum coil heating, Minimum supply current, Minimum power consumption, Power factor correction.
- Fault tolerance (feeders with broken springs can still operate, eliminating the need for unscheduled maintenance).
- Many feeders can be placed on the same electrical circuit without fear of circuit overload.

The **ATAC** Controller is a true closed loop control system. There are two components to the **ATAC** section of the Control System, the Motion Sensor and the **ATAC** Controller.

- **Mode 1: Frequency Sweep Active Tuning Amplitude Control.**

In this mode the **Atac** will perform a frequency sweep after power up. The sweep begins at **160Hz**, and will end at **40 Hz**. Upon completion of the frequency sweep the **Atac** will go into "**normal operation**" at the drive frequency. During "**normal operation**" the **Atac** will automatically adjust the output voltage to maintain the vibration intensity at the desired Set Point (**Amplitude Control**), and continuously adjust the output drive frequency to keep the feeder operation at resonance for maximum efficiency (**Active Tuning**).

- **Mode 2: Fixed Frequency, Active Tuning Amplitude Control.**

In this mode the **Atac** will go into "**normal operation**" at the drive frequency selected during the frequency control adjustment. During operation the **Atac** will automatically adjust the output voltage to maintain the vibration intensity at the desired Set Point (**Amplitude Control**) and continuously adjust the output drive frequency to keep the feeder operating at the selected drive frequency (**Active Tuning**).

- **Mode 3: Fixed Frequency Amplitude Control.**

In this mode the **Atac** will go into "**normal operation**" at the drive frequency selected during the frequency control adjustment. During operation Set Point (**Amplitude Control**) is performed but there is no adjustment made to drive frequency (**Active Tuning**) is turned off.

- **Frequency Sweep Power Level:**

This adjustment only applies when the Atac is setup to run in Mode 1. This allows the frequency sweep power level to be adjusted to accommodate smaller and larger feeder bowls to accurately detect the resonance of the feeder during the **Mode 1** frequency sweep function.

- **Full Scale Intensity Adjust:**

This adjustment made with Pot 2, alters the gain on the motion sensor, and thus changes the value of the full-scale vibration intensity as set via the Set Point dial of the unit.

- **Loop Gain:**

The loop gain is an adjustment that results in a tradeoff between speed of response (*to a step change of the Set Point, or sudden feeder loading*) and control stability.

- **Universal Input Enable for Operate/Hold:**

The Universal Input allows remote operation of the **Operate/Hold** feature. Any voltage AC or DC, from 5 volts RMS minimum to 120 volts RMS maximum applied to the input will put the unit into **Operate**. A zero volt input will place the unit into **Hold**.

- **Operate / Hold Relay Output:**

This feature is useful for communicating the operational status of the unit to another Atac, a PLC, or any other monitoring device. The relay output is rated to switch between 0 and 250 volts RMS, AC or DC, with a maximum of 1 Amp.

- **Display Select:**

This switch selects between displaying frequency or speed.

- **Soft Start:**

Many vibratory feeders will “surge” on restart (*going from hold to operate*). The **Soft Start** feature eliminates this surging by slowly ramping the power up to the specified Set Point over a period of one second.

## **(1) Smart Trigger (15 Amps RMS Output Capacity)**

The **ST-1900** Series of Controls are used to operate vibratory bowls with part sensing, and storage hoppers fitted with electronic bowl level detectors. The **10 to 24 Vdc adjustable power supply** and sensor time delays are provided by the control. The demand cycling of the bowl or hopper is controlled by the sensor’s output signal processed through the time delay settings of the unit if selected. The units are operational in both **Open Loop** and **Closed Loop (sensor option)** mode.

- **Soft-Start:**

Soft-Start is switch selectable which allows the feeder bowl to cycle on gently. A ramped ‘on cycle’ of approximately 0.8 seconds keeps piece parts from falling off the tooling when the bowl turns ‘On’ upon track level sensor demand. In addition, the tooling, drive mechanism, and drive springs are shocked less with each ‘On’ cycle.

- **Line regulation, Surge Protection:**

Line regulation and surge protection along with transformer isolation of the logic circuits allows the control’s output to compensate for fluctuations in the supply voltage and sudden power surges.

- **NPN or PNP Track level sensor Interface:**

NPN or PNP track level sensor interface signal input is provided for either a NPN current sinking or PNP current sourcing type sensor. The 10 to 24 Vdc power supply with 500 mA of current is available for the sensor and other devices.

- **Run Interlock Input (Remote Hold):**

Run Interlock input (Remote Hold) is provided so the control can also be turned On/Off, (Hold mode), by a PLC or other feeder control. This input is jumper selectable. Remote Hold can be controlled by an NPN or PNP track level sensor, dry contact closure or 5 volts RMS minimum to 120 volts RMS maximum (AC or DC) voltage input

- **Power Output Range Select (Open Loop Mode):**

Power output range select (Open Loop Mode) adjustment allows the control to be preset for the maximum output of the main control potentiometer. By limiting the 'Full On' output, an operator cannot turn the main potentiometer up to high. This feature can prevent destructive hammering of the drive coils, tooling cracks, and spring breakage.

- **On and Off Delays:**

On and Off delays are independently adjustable to provided (0-15 sec) timing for the track level sensor. This allows a precise level of part flow to be maintained to the machine.

- **120 Vac and 220 Vac Models:**

120Vac and 220Vac models are available, and will operate on either 50 Hz or 60 Hz line frequency.

- **Frequency Selectable:**

Frequency selectable outputs are available. 30Hz, 40Hz, 60Hz and 120Hz for 60 cycle line frequency. 25Hz, 33.3Hz, 50Hz and 100Hz for 50 cycle line frequency

- **Phase Select:**

Phase select feature enables which **phase** of the line voltage the controller triggers off of on the 30Hz and 60Hz frequency output selection only. This allows balancing of the source when multiple units are utilized

- **Operate / Hold Out (Interlocking):**

This is a unit functional output of **+5 Vdc** indicating **Operate mode** and a **0 Vdc** output indicating the controller is in **Hold mode**. This function is used not only for indication but also for multiple controller interlocking control.

- **Auxiliary Control Inputs:**

Auxiliary control inputs are jumper selectable of either 0 to +5 Vdc or 0 to 20mA, replacing the main control potentiometer.

## **(1) Smart Trigger (15 Amps RMS Output Capacity)**

The **ST-1400** Series of Controls are used to operate vibratory bowls with part sensing, and storage hoppers fitted with electronic bowl level detectors. The demand cycling of the bowl or hopper is controlled by an external input signal processed through the **Remote Hold** and time delay settings

of the unit if selected. The units are operational in both **Open Loop** and **Closed Loop (sensor option)** mode. An optional input connection for a **10 to 30 Vdc** power supply is available so that a **NPN** or **PNP** track level sensor can be operated.

- **Soft-Start:**

Soft-Start is switch selectable which allows the feeder bowl to cycle on gently. A ramped ‘on cycle’ of approximately 0.8 seconds keeps piece parts from falling off the tooling when the bowl turns ‘On’ upon track level sensor demand. In addition, the tooling, drive mechanism, and drive springs are shocked less with each ‘On’ cycle.

- **Line regulation, Surge Protection:**

Line regulation and surge protection along with transformer isolation of the logic circuits allows the control’s output to compensate for fluctuations in the supply voltage and sudden power surges.

- **(Optional) Track level sensor Interface:**

A single input is provided for either a NPN current sinking or PNP current sourcing type sensor. An auxiliary power supply must be connected to the power supply input. The sensor input is also jumper selectable into the Remote Hold section with and without time delay option.

- **Run Interlock Input (Remote Hold):**

Run Interlock input (Remote Hold) is provided so the control can also be turned On/Off, (Hold mode), by a PLC or other feeder control. This input is jumper selectable. Remote Hold can be controlled by an NPN or PNP track level sensor, dry contact closure or 5 volts RMS minimum to 120 volts RMS maximum (AC or DC) voltage input

- **Power Output Range Select (Open Loop Mode):**

Power output range select (Open Loop Mode) adjustment allows the control to be preset for the maximum output of the main control potentiometer. By limiting the ‘Full On’ output, an operator cannot turn the main potentiometer up to high. This feature can prevent destructive hammering of the drive coils, tooling cracks, and spring breakage.

- **On and Off Delays:**

On and Off delays are independently adjustable to provided (0-15 sec) timing for the track level sensor. This allows a precise level of part flow to be maintained to the machine.

- **120 Vac and 220 Vac Models:**

120Vac and 220Vac models are available, and will operate on either 50 Hz or 60 Hz line frequency.

- **Frequency Selectable:**

Frequency selectable outputs are available. 30Hz, 40Hz, 60Hz and 120Hz for 60 cycle line frequency. 25Hz, 33.3Hz, 50Hz and 100Hz for 50 cycle line frequency

- **Phase Select:**

Phase select feature enables which **phase** of the line voltage the controller triggers off of on the 30Hz and 60Hz frequency output selection only. This allows balancing of the source when multiple units are utilized

- **Operate / Hold Out (Interlocking):**

This is a unit functional output of **+5 Vdc** indicating **Operate mode** and a **0 Vdc** output indicating the controller is in **Hold mode**. This function is used not only for indication but also for multiple controller interlocking control.

- **0 to +5Vdc Auxiliary Control Input:**

Auxiliary control input 0 to +5V dc is jumper selectable replacing the main control potentiometer.

## **(1) Auxiliary Power Supply Board**

The **01-117 Auxiliary Power Supply Board** is used to operate optic and proximity sensors when required for additional feeder bowl and inline track control.

- **+24 Vdc** Power Supply.
- **750 milliamp Output Capacity.**
- **Modular Design**, for stand-alone and plug in connection.
- **Output Voltage** with terminal connections.
- **On Board Fuse Protected**

## **(2) Auxiliary Sensor Board**

The **01-116 Auxiliary Sensor Board** is used to operate optic and proximity sensors when required for additional feeder bowl and inline track control. They may also be configured to control the on off timing of tooling air jets.

- **Modular Design**, for stand-alone and plug in connection.
- **Operate from a 12 or 24 Vdc** Power Supply.
- **NPN Sensing device.** Operating range from 10 to 30 Vdc, 120 mA max.
- **LED Status Indicator.** Green “on” when part present.  
Red “on” when unit is timed out and relay on.
- **Timing adjustment for On and Off delay.** .1 to 10 Seconds  
**Off** delay CW to increase:  
**On** delay CW to increase
- **Logic Level Output Relay**
- **DIP Switch** selectable program modes.