

---

# GRAPHICAL

---

# PUMP CONTROLLER

---



## Station Master 500 Series

### FEATURES

- Duplex, Triplex or Quadraplex Pump Control
- Constant Speed or Variable Speed Control
- First On / First Off Pump Alternation
- Running Time Meters
- Pump Start Counters
- Failed Pump Replacement
- Accepts 4-20 mA, 0-10 VDC, 0-5 VDC analog input
- 0-10 VDC Variable Speed Output
- Pump Down

The Station Master 500 Series of controllers is a powerful Duplex or Triplex Pump Controller with an "easy to see, easy to set" interface.

During operation, the Controller displays the process level in 0.9" high characters for ease of viewing.

Pressing any button turns the screen's backlighting on and the display shows all pertinent information on a single screen including: the process level, the number of pumps in the alternator, each pump's status, and the analog output in percent.

The Station Master 500 Controllers incorporate First-On/First-Off (FOFO) pump alternation to minimize the number of pump starts. All 500 Series controllers have "failed pump" inputs. The 502 and 503 Series controllers have pump "unavailable" inputs. The 'failure' and 'unavailable' inputs inform the controller's alternator to ignore the "off line" pump in the alternation sequence.

The controller has Pump Running inputs to activate the controller's integral Running Time Meters and Pump Start Counters.

The Station Master 500's control span is user configurable. The controller accepts a nominal 4-20 mADC input and transforms that input into any calibrated span to a maximum of 100'. The controller is ideally suited for use with Contegra's SLX 130-M submersible transducer.

All of the analog setpoints are adjustable in feet and tenths of feet. The analog setpoints include: Low Alarm On & Off, Lead Pump On & Off, 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Lag On & Off, High Level Alarm On & Off and Analog input signal Out of Range.

The variable speed control setpoints are fully adjustable as "percent of VDC output." The setpoints are set for each pumping stage and include "Minimum VFD Speed", "Maximum VFD Speed", "Minimum Speed Level" and "Maximum Speed

# Station Master 500 Series

## Specifications

**Power:** 24 VDC (20.4 - 28.8 VDC)  
The 24 VDC can also power the submersible level transducer.

**Display:** LCD (Liquid Crystal Display)  
Full graphics, legible to 0° C

**Inputs:**  
**Digital:** Eleven  
**Analog:** One — 0-10 VDC (1023 count)  
The controller is provided with a 470Ω resistor for a 4-20 mA process level input.

**Outputs:**  
**Relay:** Four, Normally Open  
8A resistive  
3A inductive.  
**Analog:** One, 0-10 VDC (1023 count)

**Connections:** 26-21 AWG stranded  
Spring clamps

**Operating Temperature:** -40° to +70° C

**Dimensions:**  
**Operator Interface:**  
3.25" x3.25" (WxH)  
0.875" deep (in front of door)  
**I/O Modules**  
4.25" x 3.5" (WxH)  
2.75" deep (behind door)

**Ratings:** UL 508

The **Station Master 500** series controllers are designed for use in Pump-Down applications. The **Station Master 600** Series controller are designed for use in Pump-Up applications.

## Engineering Specifications

This specification covers a complete and operational automatic duplex (SM502)/triplex (SM503)/Quadruplex (SM504) pump control and alarm system responding to the \_\_\_\_\_ level as shown on the plan drawings.

The controller shall accept a single analog input signal over a user definable, field configurable range. The controller shall automatically control the operation of two (SM502)/ three (SM503)/four (SM504) constant/variable speed pumps in response to fluctuations in the wet well level and as determined by the customer's field-configurable setpoint adjustments.

To reduce exposure to corrosive environments and ensure the control system's reliable, long-term operation, the controller shall have a sealed, user-friendly, interface that is rated to NEMA 4/IP 65. The interface shall be comprised of a graphical four-line by 16-character liquid crystal display (LCD), and nine backlit pushbuttons [Up, Down, Left, Right, SIM (simulation), ACK (Acknowledge), '?' (HELP) and ESC (Escape)]. The controller shall contain an easily understood hierarchical menu structure. The LCDs backlighting shall be under software control and shall go into a power saving mode following a factory-set period of keypad inactivity.

The operator interface shall contain an easily understood, informative "HOME" screen. The HOME screen shall show the present wet well level in double-high characters. The third line of the four-line display shall indicate the pump status including Off (O), Unavailable (U) [2-Pump or 3-Pump only], Called (C), Running (R) and Failed (F). When used to control local VFDs, the HOME screen's fourth line shall show the controller's present analog output value in percent ranging from 0 to 100%. The controller shall automatically return to the HOME screen following a period of keypad inactivity. A further period of keypad inactivity shall cause the controller to reconfigure the LCD such that the present wet well level is displayed in characters that are four times the normal character height.

The controller shall contain screens for the Lead, Lag pump (Lag1, Lag2 & Lag3 pumps as appropriate) Start/Stop setpoints and commensurate display screens used to configure the associated analog output parameters.

The controller shall contain a 0-10 VDC analog output. The analog output may be used to command the speed of local Variable Frequency Drives (VFDs). The controller shall contain clearly marked and easily understood parameters that allow the operator to configure the analog output.

The controller shall contain an external alarm input (customer's alarm) and an alarm driver that activates on customer's alarm, high level alarm, low level alarm or signal out-of-range (high or low). The controller shall contain an integral 'silence' key and shall accept an external silence input. The controller shall provide easy, convenient indication and adjustment of the operating setpoints and controller configuration without the need for tools or movable and easily misplaced/lost pins. For ease of operation and configuration, individual screens shall be provided for each of the pump On/Off control stages.

Upon power restoration, the controller shall enable its outputs in a time-step sequence as required to meet the demand. The lead pump shall be activated (if required) following a power-on/initialization delay. Additional pumps shall be added as allowed by internal, field configurable timers. The controller shall provide a 1st On/1st Off (FOFO) alternation sequence with automatic failed pump replacement. The controller shall contain inputs for Pump Running, Pump Unavailable (2-pump and 3-pump only) and Pump Failure indication. The Pump Running inputs shall activate the controller's integral pump Running Time Meters (RTMs) and Pump Start counters. Pump Unavailable and Pump Failure inputs shall cause the controller's integral FOFO alternator to advance to the next available pump.

The controller shall contain integral span, offset, and damping adjustments. The controller's scale shall be adjustable in 1/10<sup>th</sup> foot increments over a span of 0.0 to 100.0 feet.

The controller shall be powered by 24 VDC power supply. The controller shall contain a level simulation function that allows manual manipulation of the displayed process variable. While simulating, the controller shall display both the actual process level and the simulated level.

The controller shall contain a single 1024 count analog input. The analog input shall accept a nominal 0-10 VDC or 4-20 mA/ADC signal. The pump control relay outputs shall rated for 8 amps resistive or 3 amps inductive. An additional relay output shall be provided for common alarm. The complete assembly shall be designed easily mountable on the door of an enclosure by means of two 22.5 mm diameter (i.e. 7/8") mounting holes. The complete assembly shall be designed for use in UL508 Industrial Control Panels. All job connections shall be at conveniently located spring-clamp type terminals.

It is the specific intention of this functional requirement that a standard controller shall be provided with features as described herein. Additionally, this controller shall be a fully-integrated assembly. That is, the furnishing of similar functions using multiple setpoint modules, or extensive relay/timer logic to accomplish control sequences, etc., is specifically precluded by this specification and is not acceptable. The controller shall be a Contegra STATION MASTER 500 Series Pump Controller.

(Refer to web site for specifications which may be copied and pasted into a word processor.)

## Ordering Information (SEE EXAMPLE BELOW\*\*)

Model	Pump Type
SM502 = 2 Pump	CF = Constant Speed
SM503 = 3 Pump	VF = Variable Speed
SM504 = 4 Pump	

Consult your Contegra representative, the factory, or [www.Contegra.com](http://www.Contegra.com) for additional options

\*\* A typical model number is SM503-VF  
This includes the Station Master Pump Controller with FOFO (First On-First Off) Triplex Pump Control of variable speed pumps and "failed pump replacement".

Specifications are subject to change without notice.



Represented by:



Contegra Inc.  
1286 Carriage Hills Drive  
Eagan, MN 55123

PHONE: 651-905-0900  
FAX: 651-454-4665  
INTERNET: [Conntgra.com](http://Conntgra.com)