



SERVOPRO NOx Gas Analyzer

Quick Start Guide PN 221195Q



IMPORTANT INFORMATION

Continued safe and reliable operation of this equipment is conditional on all installation, operation and maintenance procedures being carried out in accordance with the appropriate manuals, by personnel having appropriate qualifications, experience and training. Failure to observe the requirements of the manual may result in the user being held responsible for the consequences and may invalidate any warranty. Servomex accepts no liability for unauthorized modifications to Servomex supplied equipment.

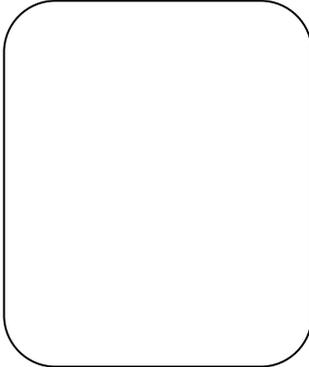
Servomex has paid particular attention to Health and Safety throughout this manual. Where special precautions need to be taken due to the nature of the equipment or product, an appropriate safety icon and warning message is shown. Special attention should be made to section 2 – Safety, where all such messages are summarized.

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North America:	Europe:	Representative:
Servomex Group Inc. 12300 Dairy Ashford Sugar Land, TX77478 United States	Servomex Group Ltd Crowborough East Sussex TN6 3FB United Kingdom	
t : +1 281 295 5800 t: +1 800 862 0200 (US toll free) f: +1 281 295 5899 e: americas_sales@servomex.com w: www.servomex.com	t: + 44 (0) 1892 603 330 f: + 44 (0) 1892 662 253 e: europe_sales@servomex.com w: www.servomex.com	

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TABLE OF CONTENTS

INTRODUCTION	4
SAFETY INFORMATION	5
DESCRIPTION	6
Overview	6
Features.....	7
TECHNICAL SPECIFICATIONS	Error! Bookmark not defined.
INSTALLATION	8
Unpacking Instructions	8
Rack Mounting	8
Rear Panel	8
Site Selection and Mounting	10
Electrical	10
Output Connections	11
Recommended Gases.....	11
Gas Handling Equipment.....	12
Gas Connections.....	12
Sampling Requirements	12
STARTUP AND SHUTDOWN	15
General Information.....	15
Shutdown Procedure	15
Proper Storage	16
MENU NAVIGATION CHART	17
Main Menu.....	17
Calibration Menu	18
Range Menu	19
Diagnostics Menu.....	20

Setup Menu	21
Alarms Menu	22
Service menu	23
Security menu	24
USING THE MAIN MENU	25
Using the Keypad	25
Shortcut Menu	26
Main Menu Screen	27
Measure Screen	28
Measure Mode	30
Analyzer Info	33
Remote/Manual	34
Standby	35
WARRANTY	36
Maintenance policy	37
Return Authorization Request	37

About this Quick Start Guide

This guide covers the basics of the installation, connections, software interface overview and routine maintenance of the SERVOPRO NOX. It is not intended to be a full installation manual but is a quick guide for those that are familiar with the use and maintenance of analytical or process instrumentation.

A separate SERVOPRO NOX Installation and Operations manual is supplied with the analyzer providing details on the software configuration and operation of the analyzer.

The information in this guide is general therefore use this manual for:

Installation:	To take commissioning to the point where the analyzer is powered and operational. The installer is advised to read the full manual completely before completing installation.
Configuration:	How to set up the clock, alarm levels, analogue outputs, relays and other parameters.

SAFETY INFORMATION

Read this Quick Start Guide and the full SERVOPRO NOX Installation and Operations manual. Make sure you fully understand its contents before you attempt to install or operate the analyzer.

The following icons are used throughout the manuals to identify any potential hazards that could cause serious injury to people. Always follow the safety instructions and be aware of the hazard.



This symbol precedes a general safety **CAUTION** or **WARNING** statement and warns of specific hazards which, if not taken into account, may result in personal injury or death.



This symbol precedes an electrical shock hazard **CAUTION** or **WARNING** statement warns of specific hazards due to high voltages which, if not taken into account, may result in personal injury or death.



This symbol precedes an elevated temperature hazard **CAUTION** or **WARNING** statement warns of specific hazards due to high temperatures which, if not taken into account, may result in personal injury or death.

A “**NOTE**” marks a short message to alert you to an important detail.

A “**CAUTION**” safety alert appears with information that is important for protecting your equipment and its performance.

A “**WARNING**” safety alert appears with information that is important for protecting you, other people and equipment from damage. Pay especially close attention to all warnings that apply to your application.

Some or all of the above symbols may appear in this manual or on the equipment. The main manual should be consulted whenever one of these symbols is encountered on the equipment.

DESCRIPTION

OVERVIEW

The SERVOPRO NO_x is a versatile analyzer which uses the time-proven Chemiluminescence Detection (CLD) method to measure NO or NO/NO₂/NO_x concentrations, all in one standard package, which can also be configured with a paramagnetic oxygen (O₂) sensor for emissions monitoring and control.

Servomex also has a heated CLD analyzer for certification testing by heavy duty engine manufacturers that must meet the stringent requirements of US EPA 40 CFR Part 1065. Both the standard and heated analyzers can be configured with internal zero/sample/span valves and an internal sampling pump.

The heated version of the SERVOPRO NO_x is not configurable with the optional O₂ sensor, this is only available in the standard version. It does however include a unique internal oven that maintains all wetted sampling components before the detector at an elevated, customer-specified temperature set to 100°C when running emissions from a compressed natural gas (CNG) engine or at 85°C when monitoring all other gaseous fuels emissions. The heated version was created for those applications that require the quenching due to CO₂ and H₂O to be below 2% of reading and in those specific cases there is a rear mounted chiller accessory that is available along with an optional WET/DRY conversion reporting feature.

Unlike conventional CLD analyzers which use a photo multiplier tube (PMT) detector, the SERVOPRO NO_x runs at atmospheric pressures allowing the use of a high sensitivity photodiode detector which does not require a vacuum pump for operation. While the PMT detector will go to much lower detection limits when used for ambient air applications, the benefits of the photodiode detector in emissions monitoring are many including not needing the high voltage required to run the PMT detector, lasts the lifetime of the instrument, and can be exposed to ambient light during servicing with no burn down time like a PMT detector.

Delivering excellent linear analysis from trace levels to high ppmv concentrations (0-3ppm to 0-3,000ppm) the SERVOPRO NO_x analyzer is ideal for continuous monitoring of industrial stationary sources emissions or ambient air monitoring. Equipped with a non-depleting photodiode to detect chemiluminescent light, the fast response time of the analyzer also makes it a perfect solution for engine and vehicle certification testing which requires 5 Hz data reporting.

FEATURES

- Measurement ranges from 0 – 3 ppm up to 3,000 ppm full-scale NO/NO₂/NO_x
- Automatic calibration and ranging
- Fast response time without compromising the detection limits
- Electronic control of sample and ozone flow to remove errors due to fluctuations
- Selectable output options of current or 1, 5 or 10 VDC
- Communication via RS-232, AK protocol TCP/IP and Modbus TCP/IP
- CE Mark and ETL listed to UL STD 61010-1; certified to CAN/CSA C22.2 STD 61010.1
- Heated Version
 - EPA 40 CFR Part 1065/1066 and Euro VI HD and Euro 6 LD compliant configuration
 - Unique internal oven

INSTALLATION



ALWAYS REMOVE POWER BEFORE CONNECTING OR DISCONNECTING SIGNAL CABLES OR WHEN SERVICING THE EQUIPMENT

UNPACKING INSTRUCTIONS

Open the shipping container and carefully remove the analyzer from the packing materials. Inspect the instrument for any sign of damage. Remove the top-cover retaining screws. Visually check for loose parts or connectors that are not properly seated. Verify that all circuit boards and circuit board connections are secure. If all internal components and their alignments look correct, re-install the cover.

NOTE

Save the original shipping container your analyzer arrives in. The shipping container and packaging are specially designed to protect the analyzer in transport. If you ever need to return the analyzer to SERVOMEX for repair or any other reason, the original shipping container and packaging should be used.

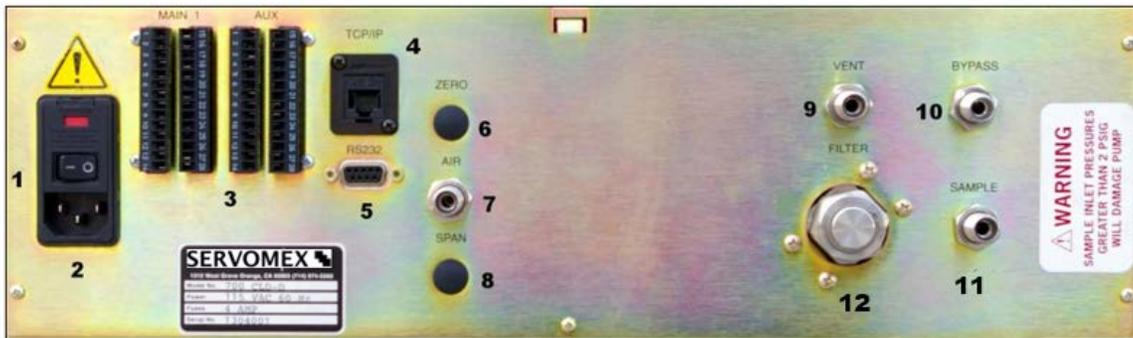
Reporting Damage

Should there be any apparent damage to either the inside or outside of the instrument due to shipping or handling, immediately notify the shipping company and SERVOMEX. The shipping container or packing materials should be retained for inspection by the shipper. See the Warranty section for details on returns and contacts.

RACK MOUNTING

The front panel is designed for mounting into a standard 19-inch rack enclosure. Holes are located on the left and right side to allow the panel to be secured in the rack by screws. Optional rack slides allow the analyzer to be pulled out of the rack enclosure for access.

REAR PANEL



The rear panel includes the following:

1. Rear-panel Power ON/OFF switch.
2. Power Entry module for power connection, power switch, fuse compartment.
3. Output connectors for analog outputs and remote functions.
4. TCP/IP connection to connect to network.
5. Serial connection to connect serial connector cable.
6. Zero Gas inlet for feeding hydrocarbon-free zero air or N₂ to the analyzer.
 - Only present with optional solenoid valves; otherwise this port is plugged.
7. Ozone Air inlet for feeding hydrocarbon-free air or oxygen to the ozone generator.
8. Span Gas inlet for feeding calibration gas to the analyzer.
 - Only present in analyzers with optional solenoid valves; otherwise this port is plugged.
9. Vent to exhaust from reaction chamber, 1/4-inch (6mm) tube fitting.
10. Sample Gas Bypass outlet (vent) for exhaust of sample, 1/4-inch (6mm) tube.
11. Sample Gas inlet for introducing sample gas into the analyzer, 1/4-inch (6mm) tube.
12. Analyzer filter housing (Standard configurations only)

SITE SELECTION AND MOUNTING



CAUTION: *The following precautions must be carefully observed:*

1. Select a site free from direct sunlight, radiation from a high-temperature surface, or abrupt temperature variations.
2. This analyzer is *not* suitable for installation outdoors.
3. Select a site where the air is clean. Avoid exposing the instrument to corrosive or combustible gases.
4. The instrument must not be subject to severe vibration. If severe vibration is present, use isolation mounts.
5. The instrument is designed for rack mounting. Optional rack-mount slides are available.
6. Do not install the SERVOPRO NO_x analyzer near equipment that emits electromagnetic interference (EMI).

NOTE

A front and rear supporting brace or equivalent is required if the optional rack mount slides were not purchased.



The Power On/Off switch is accessible from the rear of the analyzer only. DO NOT mount the analyzer in a manner that leaves the Power On/Off switch inaccessible.

ELECTRICAL

All wiring is connected at the rear of the analyzer. The AC power cord is connected to the power entry as shown below:



AC Power Switch, Connector and Fuse.

NOTE	<i>A defective ground may affect the analyzer's operation. Shielded wiring is recommended for output signals</i>
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OUTPUT CONNECTIONS

Review the [Analog and Digital Interface](#) section in the complete Operator's Manual for detailed instructions on proper setup instructions for the various output selection options. Shielded wiring is recommended for output signals.

RECOMMENDED GASES

Zero calibration for the SERVOPRO NO_x requires ultra high-purity nitrogen (UHP N₂) or calibration-grade air, plus a span gas. The recommended span gas for this analyzer is NO in a background of N₂. NO in a background of air is not recommended as some of it will convert to NO₂.

Calibration gases can be introduced through the calibration ports on the back of the analyzer (if optional solenoid valves have been installed) or through the sample inlet. Gases introduced through a calibration port should be at 20-25 PSIG. If the calibration gas is introduced through the sample port, pressures should be as follows:

1. With sample pump – no pressure.
2. Low-pressure configuration should be 3-7 PSIG.

GAS HANDLING EQUIPMENT

Pressure regulators for zero gas (air or N₂), ozone supply (air or O₂) and span gas cylinders are required for gas analysis using the SERVOPRO NO_x analyzer.

NOTE	<i>High levels of ammonia (greater than 10 ppm NH₃) may reduce the NO₂/NO converter's efficiency to a level that is unacceptable. If ammonia levels above 10 ppm are expected, it is recommended that a commercially available ammonia scrubber be purchased and installed on the sample line prior to the sample entering the analyzer.</i>
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GAS CONNECTIONS

If the calibration gases are not connected to calibration inlets on the back of the analyzer (if optional solenoid valves have been installed), the calibration gases will need to be delivered through the sample port at the pressure settings listed above.

The tubing from the sampling system to the gas analyzer should be made from corrosive-resistant material such as Teflon[®] or glass-coated Stainless Steel. Rubber or soft vinyl tubing should not be used since readings may be inaccurate due to gas absorption into the tubing material. For fast response, the tubing should be as short as possible and glass-coated Stainless Steel. Optimum tube internal diameter is 0.16 inch (4 mm). Couplings to the instrument are ¼-inch (6mm) tube.

	CAUTION: <i>Be sure tubing and joints are clean. Dust entering the instrument may cause it to malfunction.</i>
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SAMPLING REQUIREMENTS

Filtration

Dust must be eliminated completely in the sample stream. Use filters as necessary. The final filter must be capable of removing any particles larger than 4 microns.

Condensation

The dew point of the sample gases must be lower than the instrument temperature to prevent accidental condensation within the instrument. If necessary, bypass the sample through a dehumidifier to reduce

the dew point to 4°C or less. If the sample contains an acid mist, use an acid mist filter, cooler or similar device to remove all traces of the mist.

Presence of Corrosive Gases

The useful service life of the instrument will be shortened if high concentrations of corrosive gases such as Cl₂, SO₂, F₂, HCl etc. are present in the sampled gas.

Gas Temperature

When measuring high-temperature gases, make sure that the maximum temperature rating of the instrument 50 °C (122°F) is not exceeded in the Standard analyzer and for the Heated version the maximum rating of the instrument 100°C (212°F) is not exceeded.

Pressure and Flow Rates

The air or oxygen supply entering the instrument is controlled by a proportional flow electronic pressure controller (EPC). The regulator is factory adjusted for optimal analyzer performance.

The ozone supply (air or O₂) air cylinder pressure should be set at approximately 25 PSIG (standard without ozone pump option). The sample entering the instrument is controlled by a factory-set, precision, electronically controlled proportional flow (EPC) controller.

If the analyzer does not contain an optional internal sample pump, the sample gas entering the instrument should be at a pressure between be 3-7 PSIG with a flow capacity around 0.6 liters/min.

If the analyzer is using the optional sample pump, do not introduce a pressurized sample. The optional standard pump is capable of drawing a sample through a 6mm (1/4-inch) heated sample line of approximately 75 feet (23m). If the optional zero and span inlets are present (located on the rear panel) then the calibration Zero and Span gas cylinder pressures should be set at 25 PSIG.



CAUTION: If the analyzer contains an optional internal sample pump, the introduction of a pressurized sample gas in excess of 1.5 PSIG will damage the pump.

Sample Gas Bypass Outlet and Vent

A sample gas bypass outlet connector is located on the analyzer's rear panel (6mm, ¼-inch tube).

Pressure at this outlet should be kept at atmospheric level. **ANY** backpressure will cause an error in reading. The vent outlet is located on the rear panel and may contain high levels of ozone that should be vented away from the instrument.

STARTUP AND SHUTDOWN

GENERAL INFORMATION

Before using the SERVOPRO NOX, make sure the external plumbing and wiring have been connected correctly as shown in the Rear Panel description. All connections should be leak-tight, and inlet pressure settings adjusted as previously described.

NOTE	<i>Make sure the proper connections for the vents for the reaction chamber and sample have been made prior to powering on the analyzer, since ozone will be flowing from these vents.</i>
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Turn on the Power switch on the analyzer's rear panel. After a short delay for initialization, the digital display should illuminate. If the display does not come on, check the power source and the fuse. If the problem persists, call SERVOMEX Technical Support.

Refer to the [Using the Keypad](#) section and review the complete Operator's Manual for detailed instructions on proper setup and operation of the SERVOPRO HFID analyzer.

SHUTDOWN PROCEDURE

1. Turn off the valves on the zero, span and air cylinders.
2. If the analyzer contains the optional internal sample pump, disconnect the sample line from the rear inlet port.



CAUTION: <i>Do NOT turn off the sample pump or analyzer power at this point. Any pressurization of the pump could cause damage.</i>
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3. Allow the analyzer to draw in room air for approximately 10 minutes, or flush out any remaining sample that could cause condensation as the analyzer cools.
4. Turn off the optional internal sample pump by setting the analyzer to [Standby](#).
5. Turn off the analyzer power.

PROPER STORAGE

After powering down following the *Shutdown Procedure* above, allow the heated analyzer components to cool to room temperature before preparing for storage.

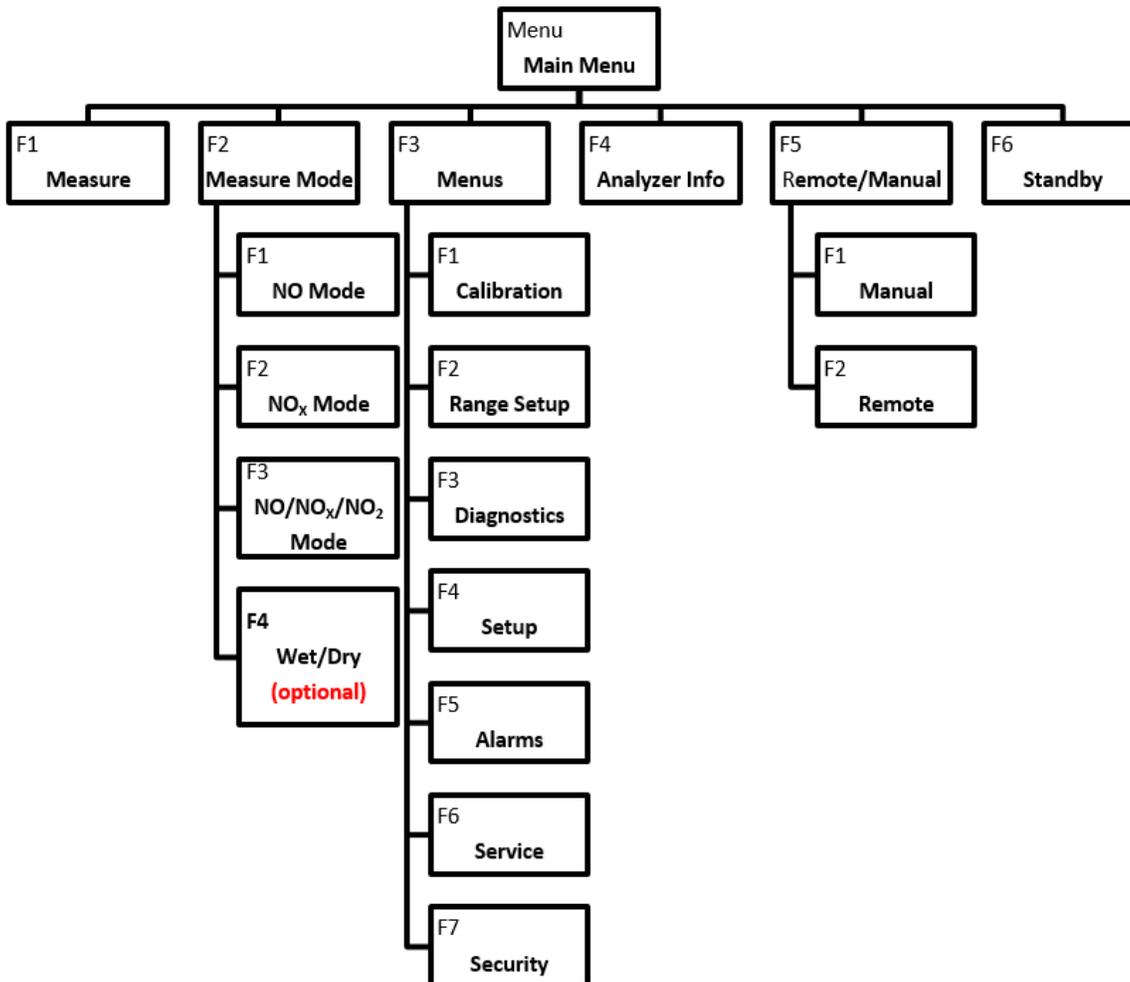
If the original shipping box was retained, the analyzer should be stored in the box in the packing material supplied. If the original box is not available and another appropriate box cannot be obtained, the analyzer can be placed in a clean, dry plastic bag.

Storage should be in a reasonably temperature-controlled environment and away from any possible exposure to dust and water or other liquids.

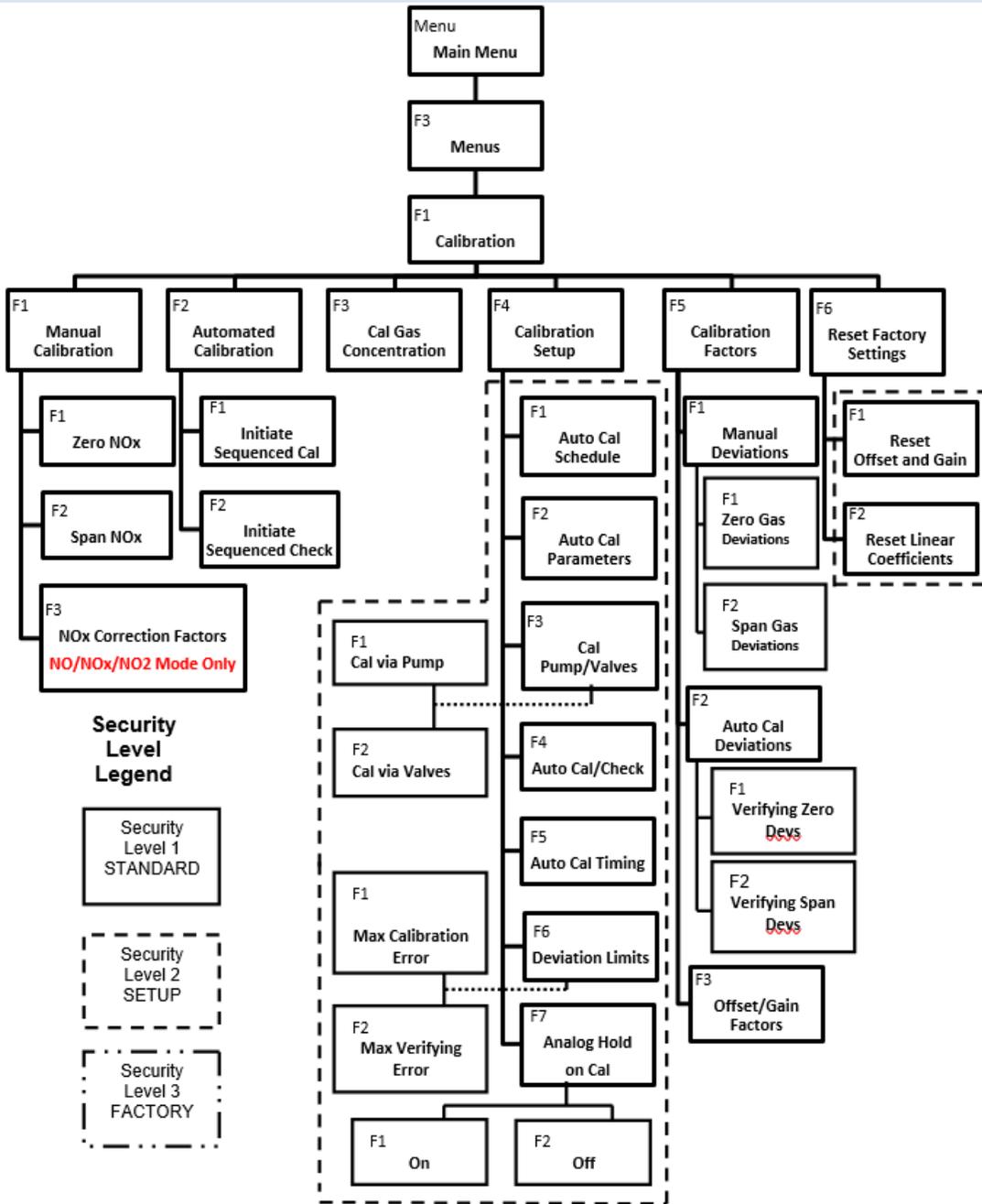
MENU NAVIGATION CHART

The Menu Flow Chart is a handy reference that will help you familiarize yourself with the operation of the SERVOMEX SERVOPRO NO_x Analyzer. Start by pressing  to access the Main Menu to quickly find any screen.

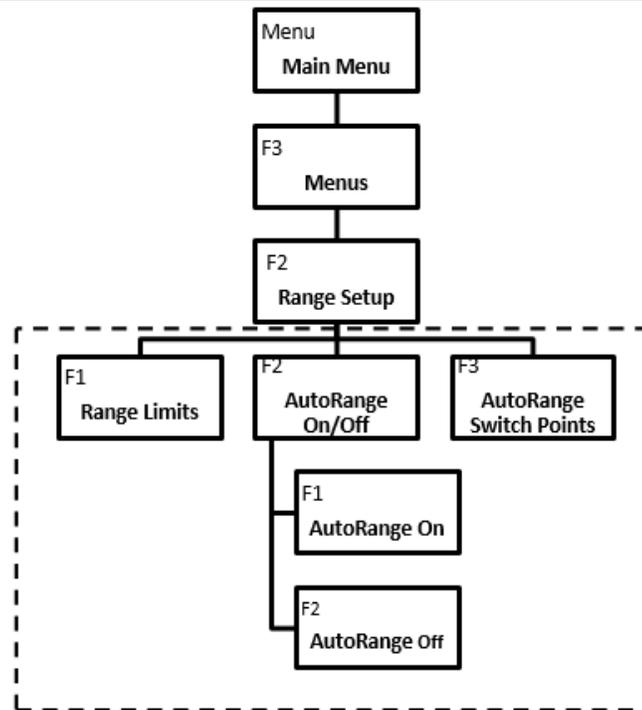
MAIN MENU



CALIBRATION MENU



RANGE MENU



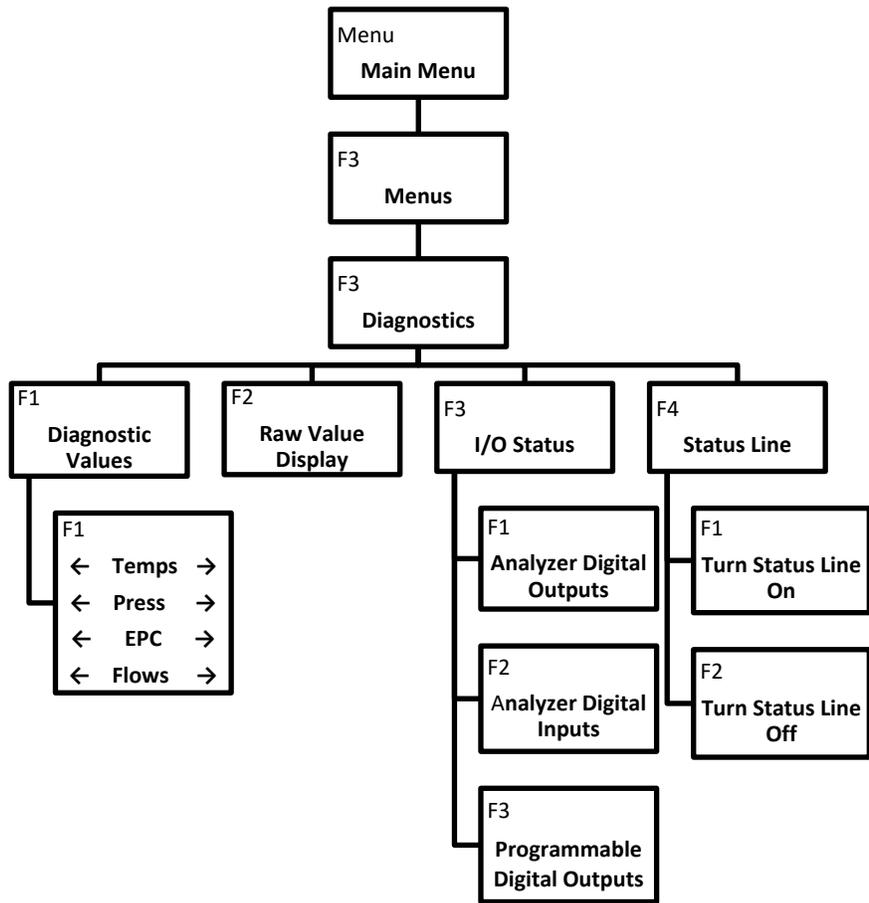
Security Level Legend

Security Level 1
STANDARD

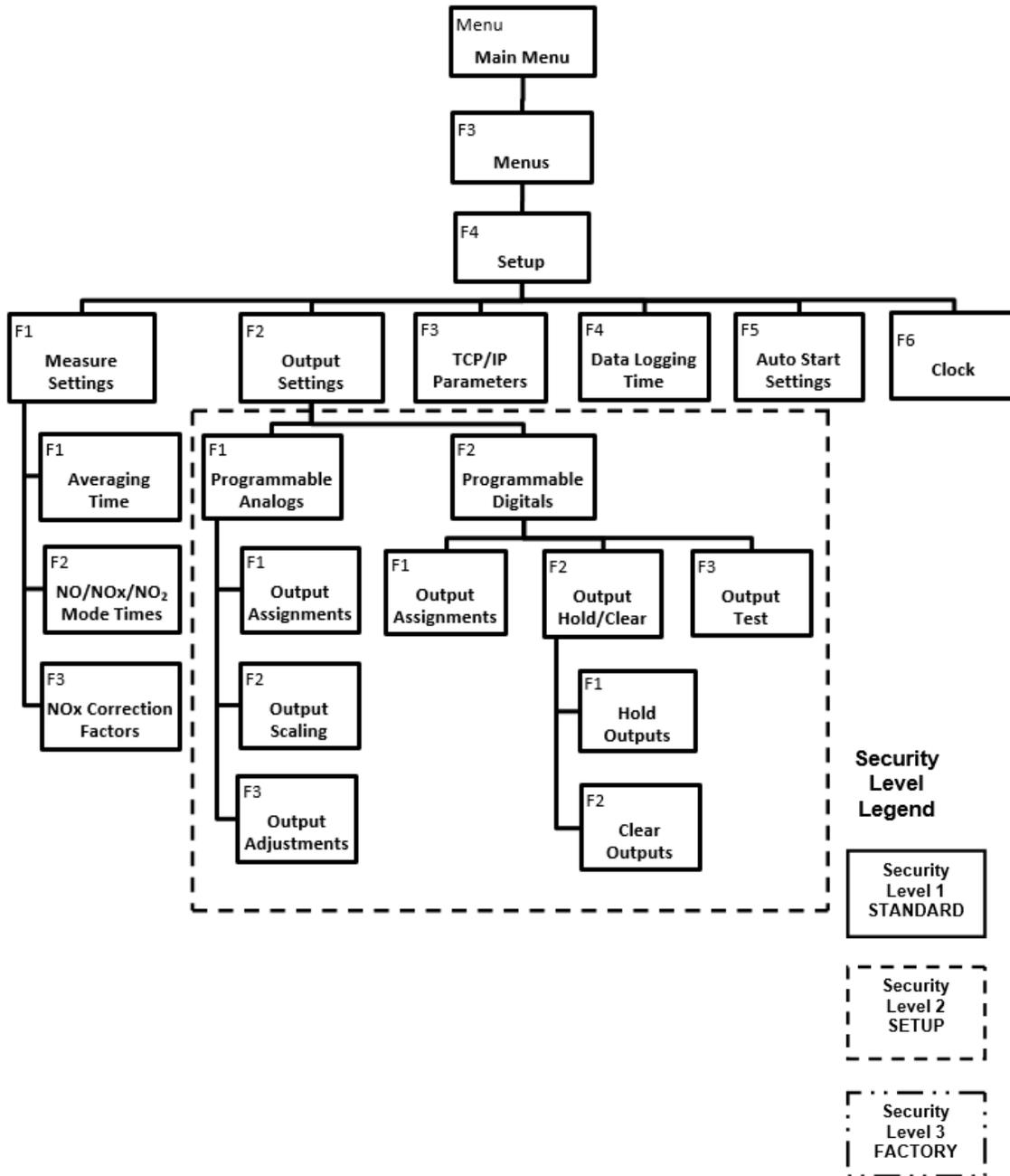
Security Level 2
SETUP

Security Level 3
FACTORY

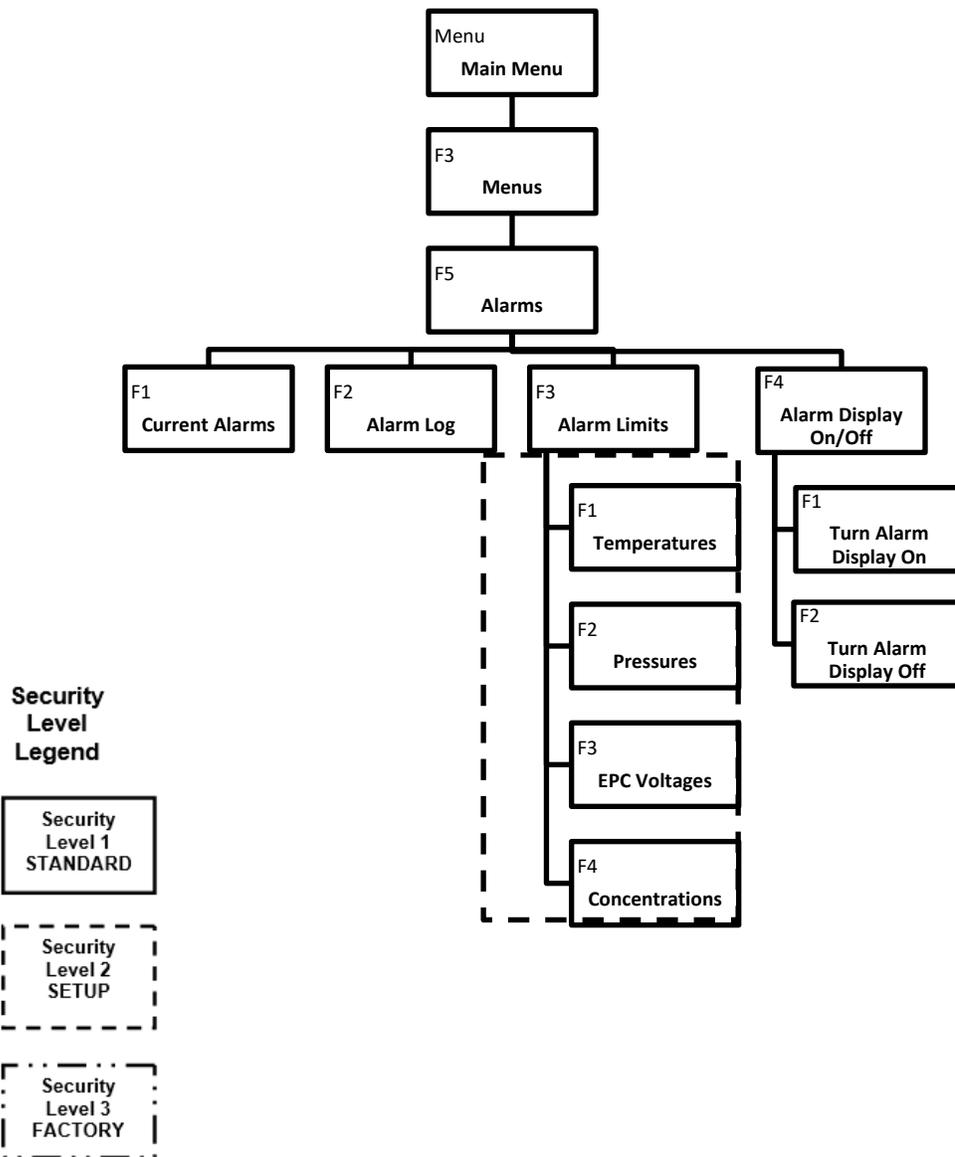
DIAGNOSTICS MENU



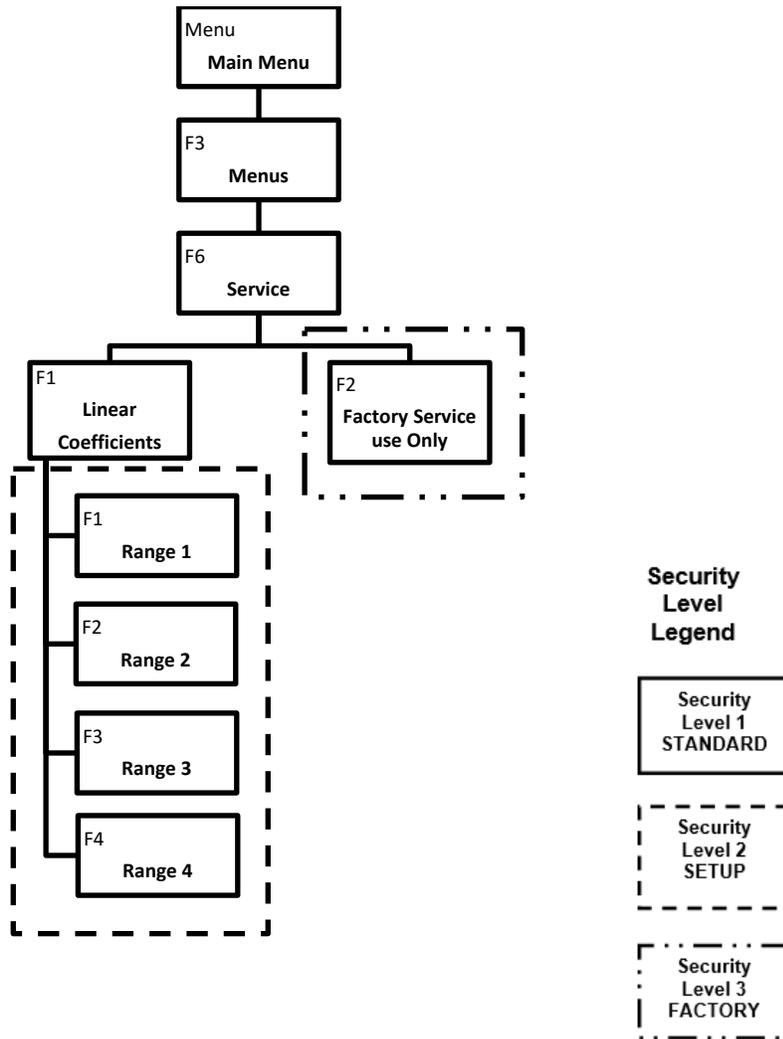
SETUP MENU



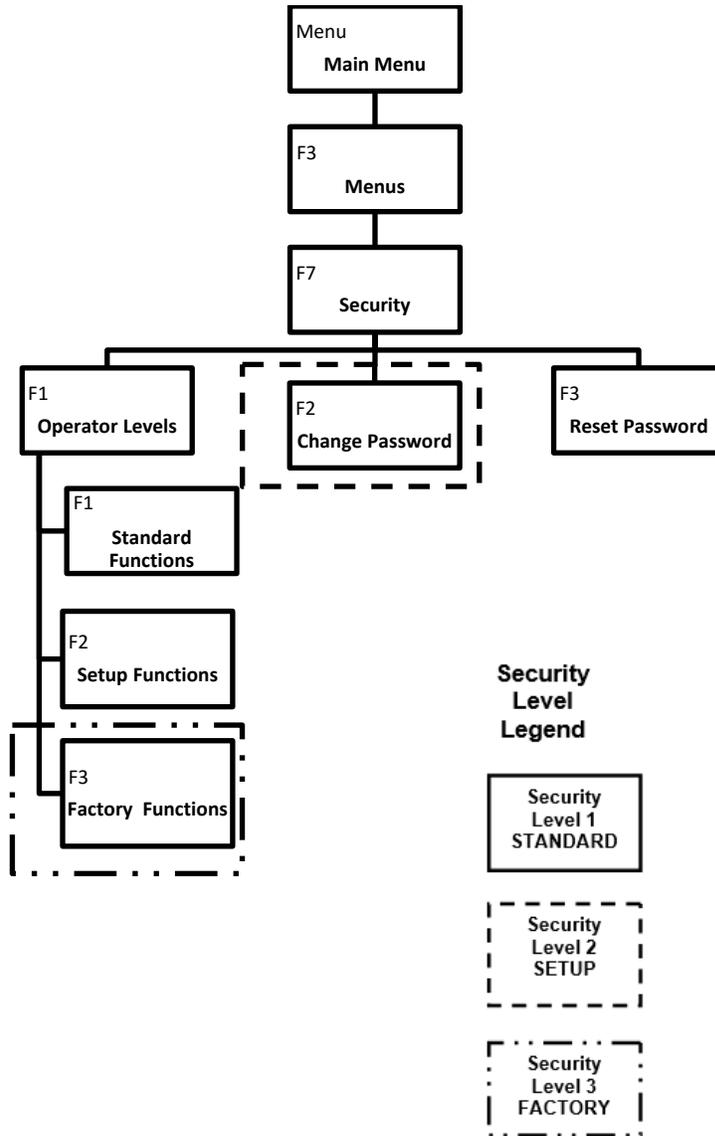
ALARMS MENU



SERVICE MENU

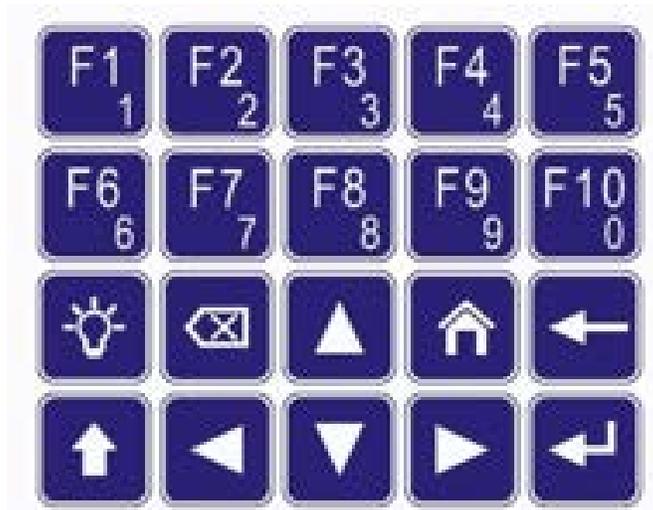


SECURITY MENU



USING THE MAIN MENU

USING THE KEYPAD



When the Measure screen is displayed, the ten **Function keys (F1 through F10)** are shortcuts to commonly used screens. On other screens, these keys can either be used as function keys or to enter numeric values. This is why each number key includes both the larger **Function number** at the top (for example, F1) and the smaller number underneath for **numeric value** (for example, 1). 

NOTE

*An N will be displayed in the bottom-right corner of the screen when the analyzer is in **Numeric Entry mode**. An F is displayed when the analyzer is being used for **Function mode**.*



The Light key is used to turn the display's backlight on and off.



This button serves two purposes:

1. In the Number Entry (N) mode, this key is used to set a decimal in place.
2. Any other time the analyzer is in the Function mode (F) and the key is used to return you to the measurement screen.



The Menu key is used to bring you to the Main Menu at any time.



The Back key is used to return to the previous screen.



The Enter key:

1. In Function mode, the Enter key selects the highlighted function.
2. When a field is highlighted for numeric input, pressing the Enter key opens the selected field for numeric entry with a blinking cursor. Pressing the Enter key a second time exits the Numeric Entry field.



Arrow Keys

1. In Function mode (F), the arrow keys move the highlight. Press the Enter key  to accept the highlighted function.
2. In Numeric mode (N) these keys control the cursor. Arrow key functions will vary as is shown on some screens.
 - a. In Numeric mode (N), the left and right arrow keys   allow you to move the blinking cursor.
 - b. The up and down arrow keys   change the value within a field that has the cursor underneath it.
 - c. The arrow keys are also used to scroll the input possibilities and edit the numbers.

SHORTCUT MENU

Scrollable list of shortcut functions available from the Measurement screen.

Shortcut Tag	Description
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	<p>Left or right arrows are used to scroll through the shortcut menu.</p>
<p>F1₁ Measure Mode</p>	<p>Allows the operator to change the analyzer's mode to NO, NO_x or NO/NO_x/NO₂.</p>
<p>F2₂ Raw Values</p>	<p>An advanced diagnostic tool used for troubleshooting.</p>
<p>F3₃ Diags</p>	<p>Diagnostic Values is used to view Temperatures, Pressures, EPC Percent Full scale and Flows.</p>
<p>F4₄ Auto Range</p>	<p>Allows operators to turn Auto Range On or Off.</p>
<p>F5₅ Manual Cal</p>	<p>Allows operators to Zero or Span the analyzer from the Manual Calibration menu.</p>
<p>F6₆ Menus</p>	<p>The Menus screen is the starting point for advanced setup and functions.</p>
<p>F7₇ Standby</p>	<p>When the analyzer is in Standby mode, it closes all valves and turns off the analyzer's optional sample pump.</p>
<p>F8₈ Range Limits</p>	<p>This screen allows operators to customize the analyzer's ranges.</p>
<p>F9₉ Span Conc</p>	<p>Operators can change Span gas concentrations for multiple ranges.</p>
<p>F10₀ NO_x Factors</p>	<p>Allows operators to set or adjust the NO_x Correction Factors.</p>

MAIN MENU SCREEN



Main Menu	
F1	Measure
F2	Measure Mode
F3	Menus
F4	Analyzer Info
F5	Remote/Manual... SREM
F6	Standby

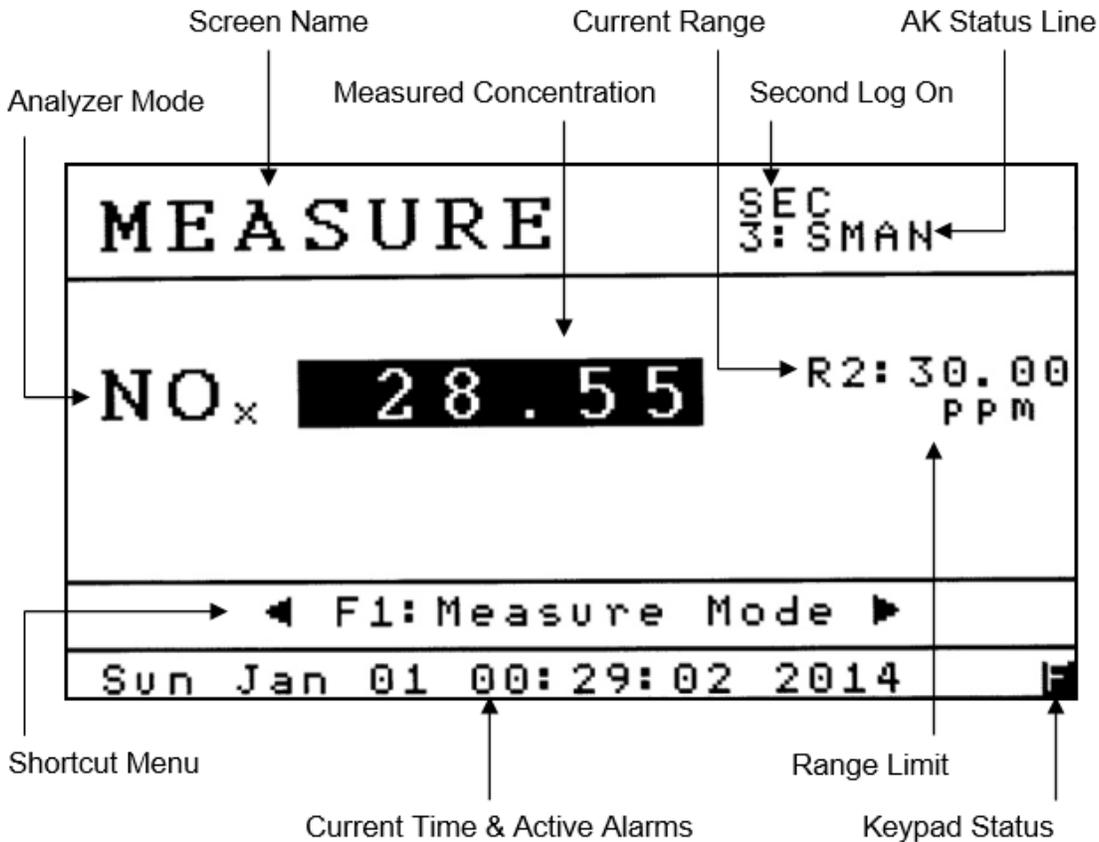
NOTE	<i>The Main Menu is your gateway to operational, setup and maintenance functions on the SERVOPRO NOx Analyzer via the corresponding function keys</i>
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All software functions of the SERVOPRO NOx Analyzer can be reached via the menu above from the Main Menu screen.

Operation starts by pressing the Menu key  to bring up the Main Menu. Use the Arrow keys     to highlight the desired function and press  to open the screen. You can also access the desired function by pressing the corresponding function key.

MEASURE SCREEN

 in Function Mode (F)



NOTE	<i>The Measure Screen provides a visual of the current concentration of the gas being analyzed, along with other pertinent information.</i>
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The Measure Screen is accessed by pressing the  key. To access the Measure Screen from the Main Menu, press .

Please review the descriptions below (corresponding with the callouts on the illustration above) to familiarize yourself with the Measure Screen.

Diagram Above Call Outs	Description
Screen Name	The name of the active screen the Analyzer is in; in this case the Measure screen.
Second Log On	SEC appears when the Second log is enabled. See Data Logging Time .

AK Status Line	When the AK Status line is enabled, it will scroll through the analyzer's present state using AK Protocol. See AK Protocol .
Analyzer Mode	The active mode the analyzer is in (NO, NO _x or NO/NO _x /NO ₂).
Measured Concentration	The current concentration that is displayed on the screen.
Current Range	The range currently being used by the analyzer. Auto Range is indicated by an A in front of the range number.
	Up and down arrows   to change the analyzer's current range.
Range Limit	The analyzer's full-scale value of the range currently in use.
Current Time/Active Alarms	Scrolls between Time and Date and any active alarms.
Keypad Status	Indicates how the keypad input is currently being used. F is for functions, N is for numeric input.

MEASURE MODE



Measure Mode
F1 NO Mode
F2 NO _x Mode
F3 NO/NO _x /NO ₂ Mode

NOTE	<i>The Measure Mode menu is used to select one of three measurement modes: NO, NO_x or NO/NO_x/NO₂.</i>
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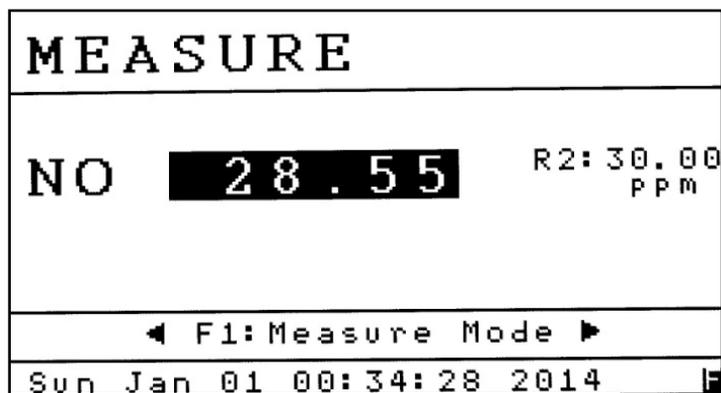
The Measure Mode menu is accessed by pressing the  key on the Main Menu. This menu will affect how the analyzer operates and what is displayed in the Measure screen.

Press  to set the analyzer in NO only mode.

Press  to set the analyzer in NO_x only mode.

Press  to set the analyzer in NO/NO_x/NO₂ mode.

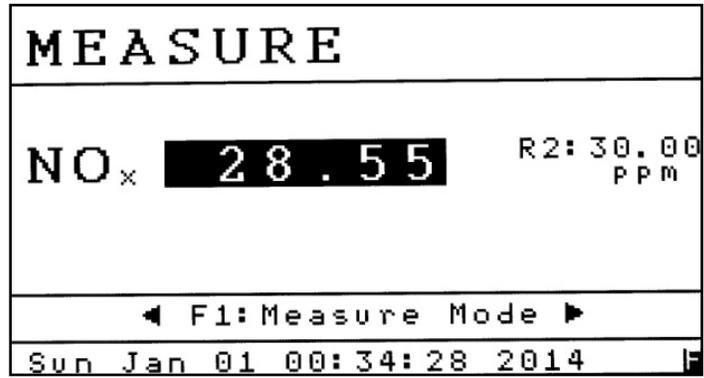
NO MODE



To move to the NO mode, press  while in the Measure Mode menu. In NO mode, the sample gas does not pass through the analyzer's NO_x converter. The final reading is NO only.

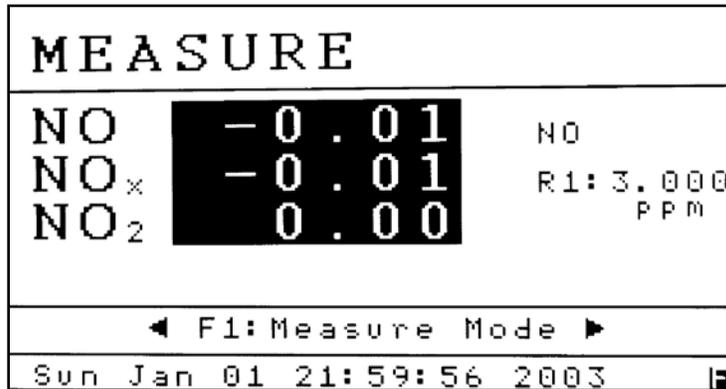
NO_x MODE





To change to the NO_x mode, press F2
2 while in the Measure Mode menu. In NO_x mode, the sample gas passes through the NO_x converter and the analyzer measures total NO_x.

NO/NOX/NO2 MODE



Example above: NO

NOTE	<i>The NO/NO_x/NO₂ Mode activates the “sample and hold” feature which allows the analyzer to automatically cycle between NO and NO_x measurement.</i>
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To change to the NO/NO_x/NO₂ Mode, press  from the Measure Mode menu. The current measuring mode (cycle) is indicated above the analyzer range.

The cycle times of the sample read are set on the [NO/NO_x/NO₂ Mode Times screen](#). All NO and NO_x readings are displayed as averaged values.

The cycle begins with the NO reading. When the NO reading is completed, the analyzer switches to the NO_x mode (through the converter). When the NO_x cycle is completed, the analyzer updates the averaged NO and NO_x values on the screen and the analog outputs. At that point, the difference between the averaged value of NO and NO_x is calculated as the NO₂ concentration. The cycle continues to repeat.

For advanced calibration and operation in NO/NO_x/NO_x mode, see [NO_x Correction Factors](#).

ANALYZER INFO



Analyzer Info 192.168.002.092	
Model	SERVOPRO NOx
S/N	1304001
Sample Pres	3.85 psi
Air Pres	15.00 psi
Software Version	
NMAIN	7.100
NUSER	7.666
OSMSR	63.024

NOTE *The Analyzer Info screen contains the basic identity of your SERVOPRO NOx Analyzer.*

The Analyzer Info screen is accessed by pressing the  key on the Main Menu.

This screen includes the Model and Serial Number of your analyzer (for easy identification if you are discussing your analyzer with SERVOMEX), factory settings for sample pressure and air pressure, and the software versions being used. The analyzer's current IP address appears in the upper-right corner of the screen.

REMOTE/MANUAL



Remote/Manual	SREM
F1 Manual	
F2 Remote	

NOTE *The Remote/Manual menu gives the operator the ability to control the instrument manually using the keypad or via a remote computer.*

The Remote/Manual menu is accessed by pressing the  key on the Main Menu. The current setting (Remote Mode) is displayed in the upper right-hand corner of the screen. **Example: SREM.**

The analyzer can be controlled remotely via:

- TCP/IP Modbus
- RS-232 AK Protocol
- Digital inputs (contact closure) located on the rear of the analyzer.

NOTE	<i>AK Protocol works with both TCP/IP and Serial. Modbus only works with TCP/IP.</i>
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STANDBY



NOTE	<i>When the analyzer is in Standby Mode, the pump is turned off and the solenoid valves are closed.</i>
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The SERVOMEX logo is displayed along with the Serial Number. Standby Mode is accessed by pressing the  key from the Main Menu.

WARRANTY

Servomex instruments are warranted to be free from defects in workmanship and materials. Liability under this warranty is limited to servicing, calibrating, and replacing any defective parts of the instrument returned to an authorized Servomex Service Center for that purpose. Fuses are specifically excluded from any liability.

This warranty is effective from the date of delivery to the original purchaser. The equipment must be determined by Servomex to have been defective for the warranty to be valid.

This warranty applies as follows:

- one year for electronics
- one year for mechanical failures

If damage is determined to have been caused by misuse or abnormal conditions of operation, the owner will be notified, and repairs will be billed at standard rates after approval.

Servomex Group Limited warrants each instrument manufactured by them to be free from defects in material and workmanship at the F.O.B. point specified in the order, its liability under this warranty being limited to repairing or replacing, at the Seller's option, items which are returned to it prepaid within one year from delivery to the carrier and found, to the Seller's satisfaction, to have been so defective.

In no event shall the Seller be liable for consequential damages. **NO PRODUCT IS WARRANTED AS BEING FIT FOR A PARTICULAR PURPOSE AND THERE IS NO WARRANTY OF MERCHANTABILITY.**

Additionally, this warranty applies only if: (i) the items are used solely under the operating conditions and in the manner recommended in the Seller's instruction manual, specifications, or other literature; (ii) the items have not been misused or abused in any manner or repairs attempted thereon; (iii) written notice of the failure within the warranty period is forwarded to the Seller and the directions received for properly identifying items returned under warranty are followed; and (iv) with return, notice authorizes the Seller to examine and disassemble returned products to the extent the Seller deems necessary to

ascertain the cause of failure. The warranties stated herein are exclusive. THERE ARE NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, BEYOND THOSE SET FORTH HEREIN, and the Seller does not assume any other obligation or liability in connection with the sale or use of said products.

MAINTENANCE POLICY

In cases when equipment fault is suspected, please notify your representative of the problem and provide them with model and serial numbers.

If the problem cannot be resolved, then ask for a Return Product Authorization Number (RPA) and shipping instructions. The issue of an RPA does not automatically imply that the equipment is covered by our warranty - that will be determined after we receive the equipment.

Pack the equipment in a suitable box with sufficient padding, include the RPA number on your paperwork, and send the equipment, prepaid, to the designated address. Servomex will not accept equipment returned without an RPA, or with reversed shipping or import/export charges.

If the warranty has expired, or the damage is due to improper use or exposure of the equipment, Servomex will provide an estimate and wait for approval before commencing repairs.

RETURN AUTHORIZATION REQUEST

Servomex must approve and sign a Return Product Authorization Number (RPA) to any instrument being returned. The RPA must appear on all paperwork and packaging.

The issuance of an RPA does not automatically imply that the instrument is covered by our warranty.

In order to serve you better and to protect our employees from any potentially hazardous contaminants, Servomex must return, unopened and at the sender's expense, all items that do not have an RPA and a signed and filled out Decontamination Form.

OSHA Hazard Communication Standard 29CFR 1920.1200 mandated that we take specific steps to protect our employees from exposure to potential hazards. Therefore, a letter certifying that the equipment has been decontaminated must accompany all equipment exposed to hazardous contamination. To obtain an RPA form, email your regional Servomex Service Center at the following addresses:

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| 1. North and South America: | americas_service@servomex.com |
| 2. Asia, Australia, New Zealand: | asia_service@servomex.com |
| 3. Europe, Middle East, Africa, India: | EMEI_service@servomex.com |