Instruction, installation and maintenance manual

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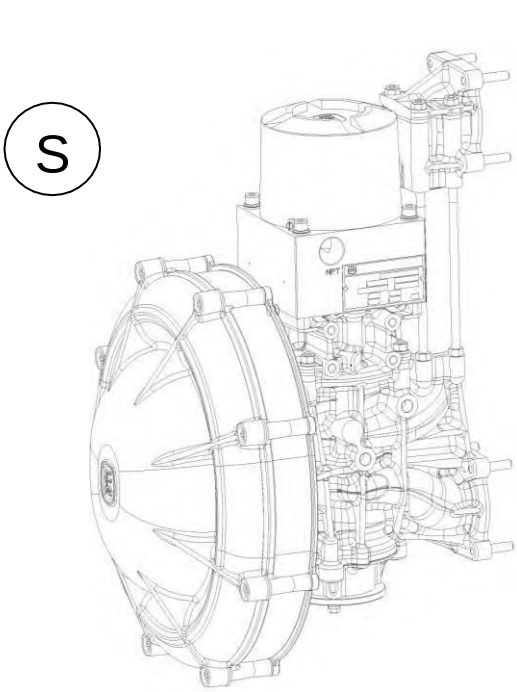
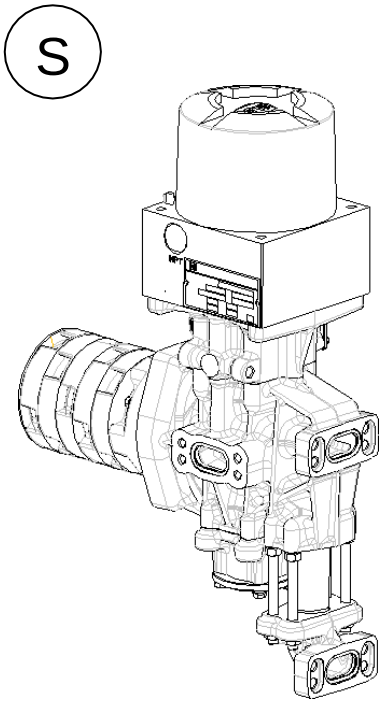
1.0 DESCRIPTION

The DPS series QT controller is a high-capacity, high-precision digital-pneumatic valve controller that replaces conventional positioner and volume booster assemblies. The DPS series QT has several advanced control and diagnostic features. There are two different models, DPS series QT (Cv30) and DPS series QT (Cv9).



CV 30 model



CV 9 model

1.1 SYSTEM DESCRIPTION

The DPS series QT components are:

1.1.1 Servo-Valve (S)

A high-capacity Servo-Valve is used to position the actuator. The Servo-Valve spool is positioned by a stepper-motor. This arrangement provides very fine and accurate control of actuator position. This assembly can be mounted directly to the actuator using manifolds, or remote-mounted. There are two Servo-Valve models, DPS series QT (Cv30) and DPS series QT (CV9).
Pressure transducers within the Servo-Valve manifold measure the pressure of the air supply and the pressure above and below the actuator piston. The stepper-motor has an integral spool-position feedback device. Standard Fail Modules for Fail-Open, Fail-Closed and Fail-In Place are available for all models.

1.1.2 Digital Controller (C)

The Digital Controller provides closed-loop control of valve position based upon input signal, valve position feedback, spool position feedback and stepper-motor control. The Digital Controller is housed in an enclosure which also features a power supply, terminal blocks, display and local controls. The Digital Controller can be mounted directly to the actuator or remote-mounted.

1.1.3 Magnetostrictive Position Feedback Probe (Z)

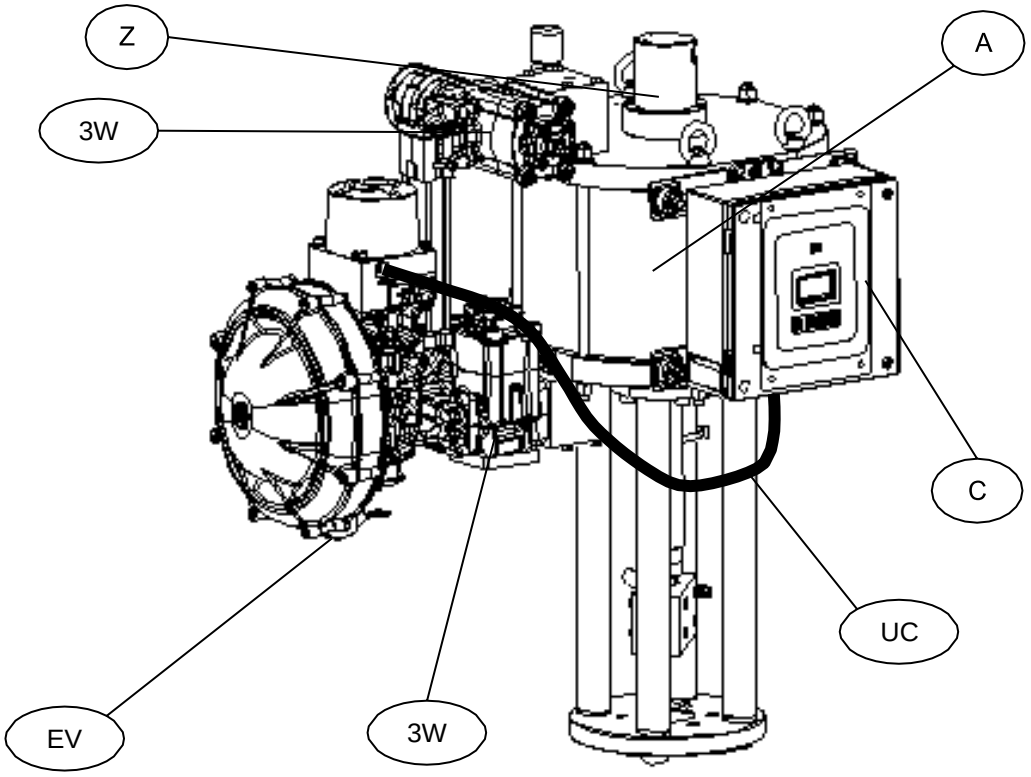
Valve position feedback is provided by a magneto-restrictive probe located in centre of the actuator top cap.

1.1.4 Actuator with DPS series QT Interface
The Cv30 uses a special STI actuator (A), with special end plates with larger ports.
The Cv30 and Cv9 use a standard STI Actuator, modified to accommodate the DPS series QT components. The actuator shaft is gun-drilled to accommodate the feedback probe.

1.1.5 Umbilical Cable (UC)
The Digital Controller and Servo-Valve / Fail Module are connected with a cable which transmits signal and power.

1.1.6 Fail-Mode Solenoid Valve (EV)
DPS series QT uses a continuously-energized, normally-closed 24Vdc solenoid valve to initiate fail mode. This Solenoid Valve is tripped by the Controller, which can initiate fail-mode on loss of air, power, signal.

1.1.7 Fail-Mode pneumatic valves (3way or 2way valve for CV 30 and CV 9 model)
The fail mode is made by those pneumatic valves that are piloted by the solenoid valve (EV).



QuickTrak™ CV 30 and actuator assembly

1.2 SPECIFICATION AND OPTIONS

1.2.1 Power Supply
The DPS series QT is a “4 wire” system; it requires a power supply independent of control signal. The power supply can be 120Vac, 240Vac, 110Vdc, 48Vdc or 24Vdc.

1.2.2 Temperature Rating
The standard working temperature for both controller and step motor assembly is -20°C to +70°C. For cold (-20 to -40°C) or for hot environment (+70 to 100°C), the Servo-Valve and the Digital Controller require a heater or a cooling system or they must be remote-mounted in a mild environment.

1.2.3 Air Supply
The air supply must be clean and dry, and should comply with ISA 7.3, para. 4.1: The dewpoint at

line pressure shall be at least 10 C (18 F) below the minimum ambient temperature. A 5 micron filter regulator will be supplied.

1.2.4 Specifications

	Standard	Option
Input Signal / Position Feedback	4-20 mA; Hart protocol	
Maximum power consumption	95W	
Power Supply Module	120 Vac ±10% 50-60Hz ±5% 240 Vac ±10% 50-60Hz ±5% 110Vdc ±10% 1A 48Vdc ±10% 3A 24Vdc ±10% 5A	
Servo-Valve, Mounting	Actuator	Remote
Digital Controller, Mounting	Actuator	Remote
Digital Controller, Cable Length	6.0 ft (~ 1.8 m)	100 ft (~ 30 m)
Electrical Classification	EMC	
Certification for Ordinary Location	IP66; UL ordinary location; NEMA4X	
Certification for Hazardous Location	Ex d IIC Tx Gb for motor enclosure Ex d IIB T6 Gb for controller enclosure	
Temperature Rating	-4 to 158 F (-20°C to 70 °C)	-40 to 212 F (-40°C to 100 °C)
Air supply	60 to 100 psig (4 to 7 barg)	
Relative Humidity	0 up to 95% (No condensation)	

2. GENERAL SAFETY INSTRUCTIONS

The non-observation of the following safety instructions and of the instruction manuals can result in with serious injury.

2.1 INSTALLATION

- Must be done by qualified person trained to operate.
- A ground tap is necessary.
- The electrical and pneumatic connections must be done according to the diagram and label.
- The supply circuit must be protected in case of current exceeding the limit fixed.
- The equipment must be provided with cable entries and filler plugs certified according to the required certification.
- The actuator must be installed and used according to the project design specification.
- The fluid must be chemically compatible with the used gaskets and lubricant.
- The supply circuits must be protect in case of current exceeding the limits fixed The user has to ensure prior to start up and during operation that the pressure transducers are correctly fixed inside the enclosure all the time.
- The rated values for pressure transducer must be observed.

2.2 MAINTENANCE

- Must be done by qualified person.
- Cleaning must be done with a humid cloth.
- Greases and oils must be used according to the manufacturer's instructions, however their flammability point must be > 140°C.

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User manual

Referred to:

HC12 software revision starting from 5.18
DSP software revision starting from 5.28
RC software revision starting from 5.26
PLD software revision starting from 1.04.00.00

Starting from release 5.00 new functions are available:

SUPPORT FOR RS232 HART MODEMS		***see chapter….***	***1.0.0***
POSITION EXCESS FAIL MODE		***see chapter….***	***3.7.2***
PRESSURE FAIL MODE		***see chapter….***	***3.7.5***
PRESSURE LIMIT		***see chapter….***	***3.7.5.3***
HART DYNAMIC VARIABLES		***see chapter….***	***3.10.7***

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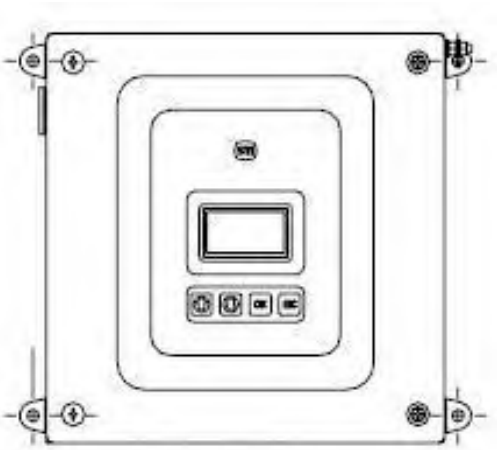
1 DESCRIPTION

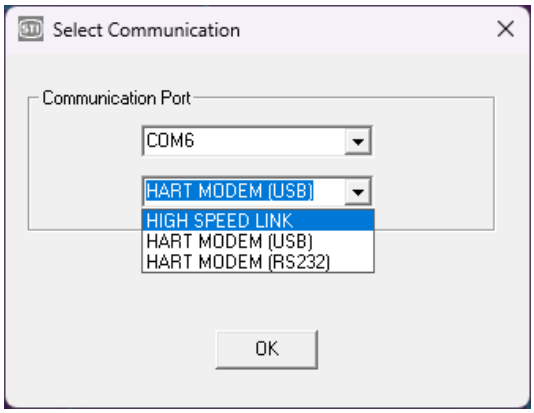
The QuickTrak III controller can be locally operated by:

- a local device monitor and 4-key keyboard located under the monitor;



- via HART a hand-held terminal;
- by a remote control panel running on a laptop connected to the controller with one of the options listed below:
    - **HIGH SPEED LINK** (RS 232 serial cable)
    - **HART MODEM (USB)**
    - **HART MODEM (RS232)**

NEW FUNCTION

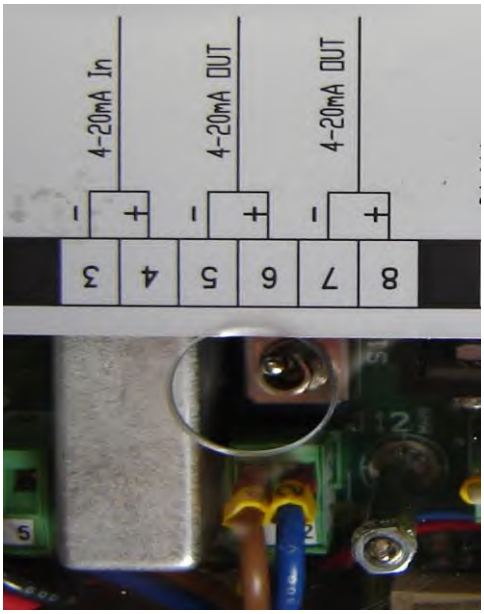


	CAUTION: In order to prevent any system reaction due to an unauthorized use or accidental contact of the keypad, the system should always be left on the MAIN page. After 5 minutes the system is in stand-by, it returns automatically to the MAIN page.

	WARNING: If communication via the HIGH SPEED LINK (RS-232 serial cable) is required, ensure that the control panel is opened only when the units are in a non-hazardous area.

1.1 CONTROLLER SWITCH ON/OFF

To turn on / off the controller, switch on /off the power switch inside the controller.



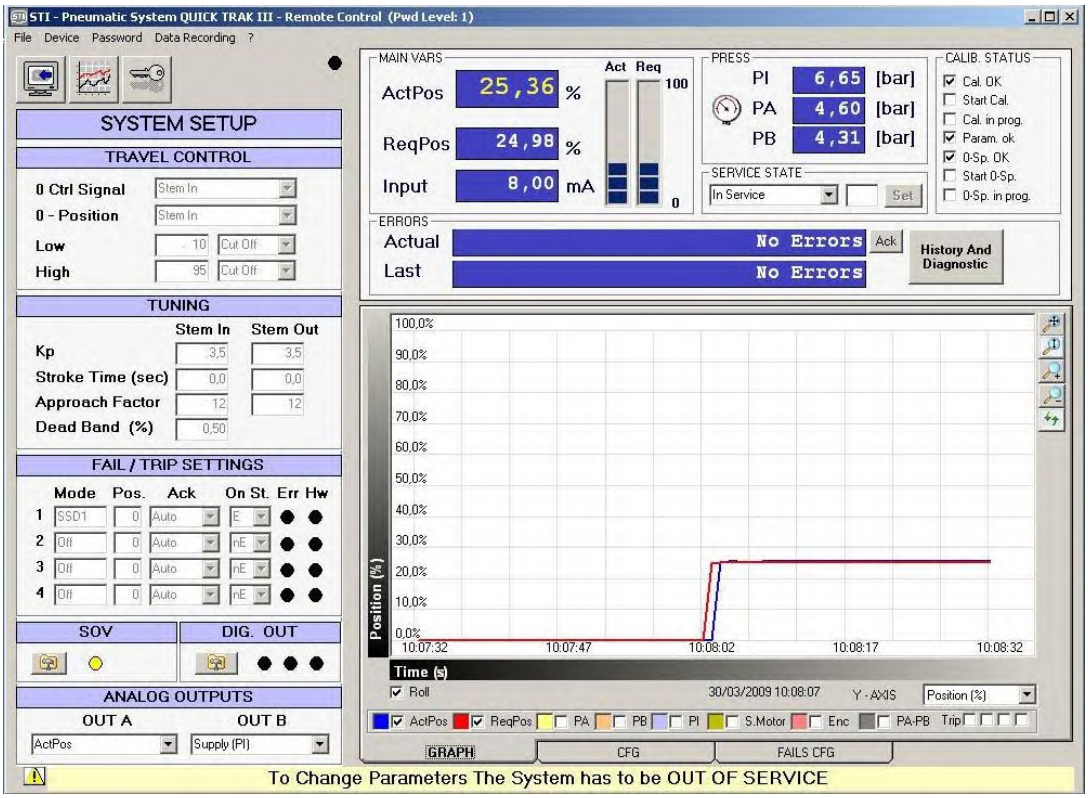
2 SOFTWARE INSTALLATION

2.1 REMOTE CONTROL SOFTWARE

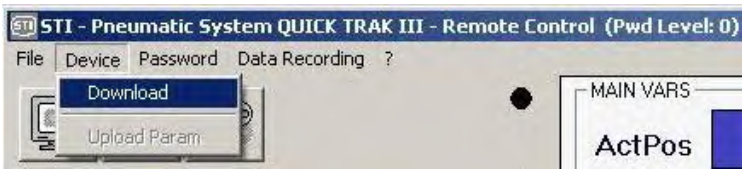
If a remote PC control via RS 232 is required, a management software should be installed on the laptop. The minimum system requirements are: MS-Windows-98, Windows-NT 4.0, Service Pack 5 or 6a, Windows 2000 or Windows XP.
To install the software:

- make sure that the minimum hardware requirements are met;
- start Windows;
- shut down all running programs;
- insert the provided CD;
- install routine should start automatically otherwise activate the program "*SetupQT3_v401.exe*";
- follow the instruction;
- insert the password. The standard software manufacturer default password is: **1 2 3 4 5**;
- download the parameters to test the communication.

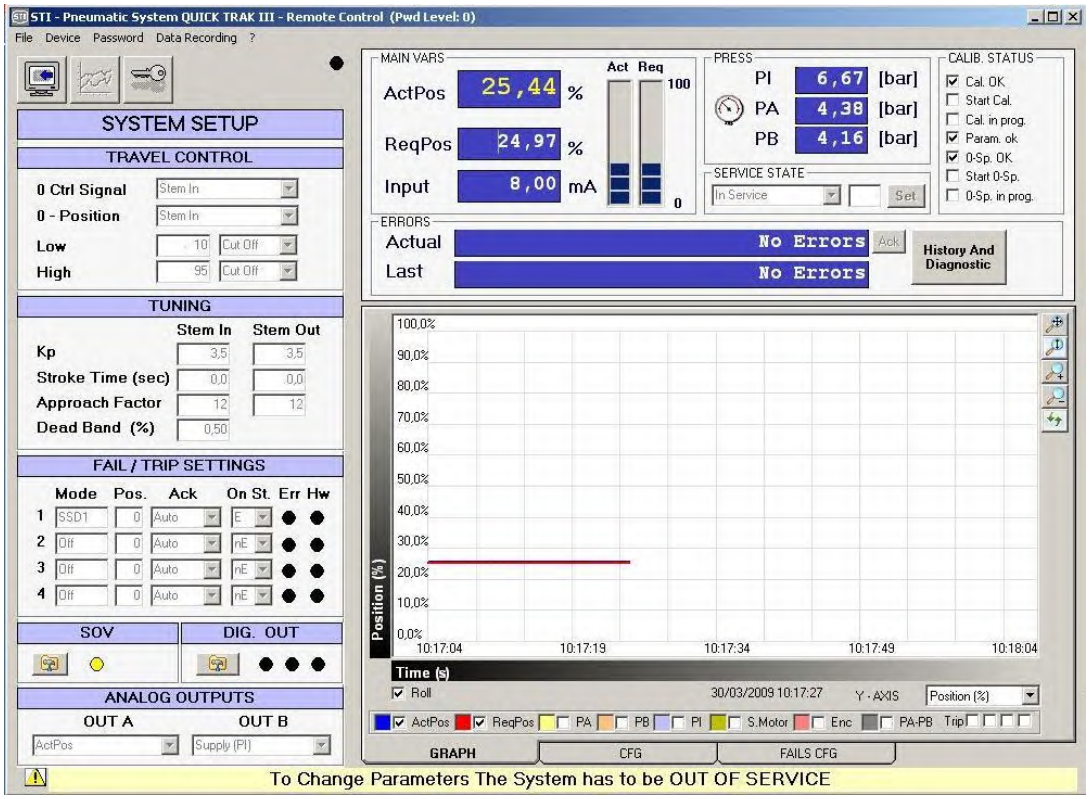
CAUTION: Do not attempt to operate the process valve in the plant without performing the calibration, as an unpredictable performance may result. A detailed description of the calibration process and the required steps are provided elsewhere in this manual.



The parameters download is available in the main command line (pull-down device menu).



At the end of the download phase the configuration parameters fields will be update.



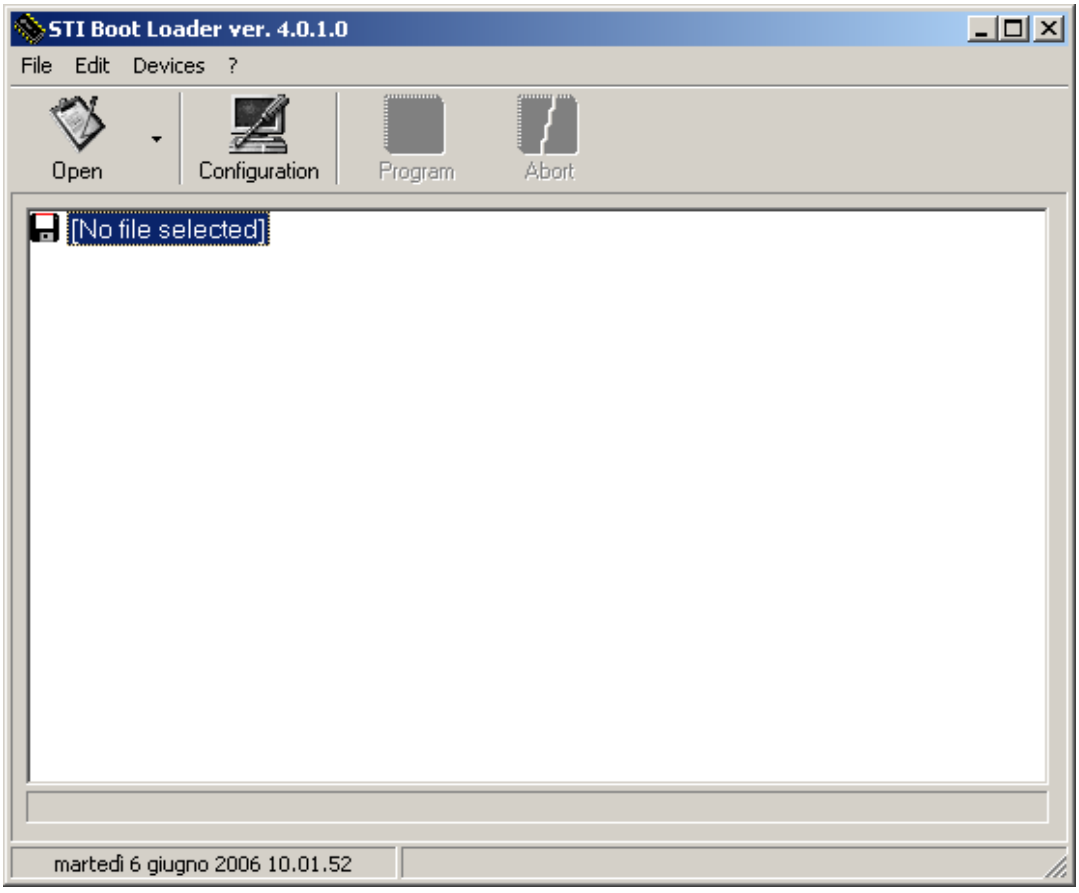
2.2 CONTROLLER SOFTWARE

The two software (DSP and HC12) are factory installed in the controller. For a new installation, a "Loader" program is necessary. It can be installed selecting “SETUP.exe” file from the supplied LOADER software cd. A shortcut should appear in the program selection of start menu. Select the “Loader” access program:

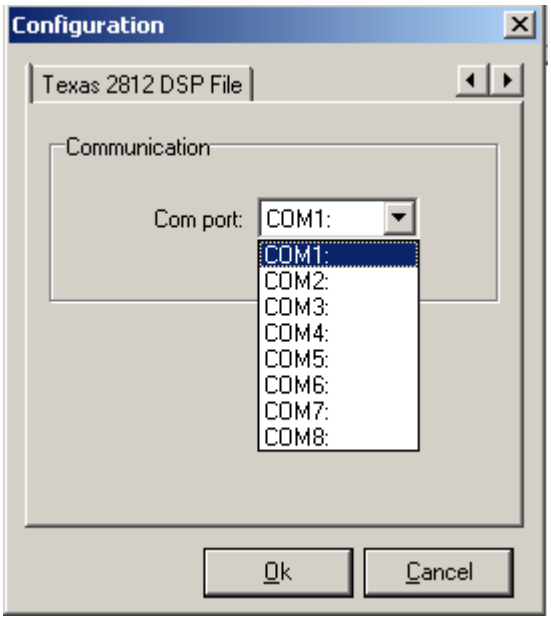
Program » Loader » Loader

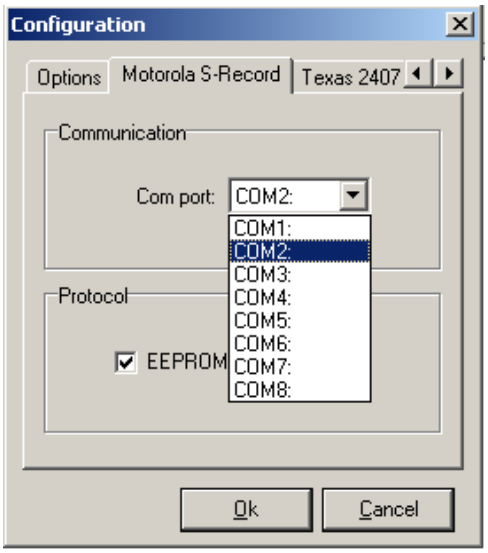
Or select it directly:
C:\Program Files\STI s.r.l\Loader\Loader.exe

The following window will appear:



Configure the PC COM port selecting: “Configuration” from EDIT menu for both Texas (DSP) and Motorola (HC12).



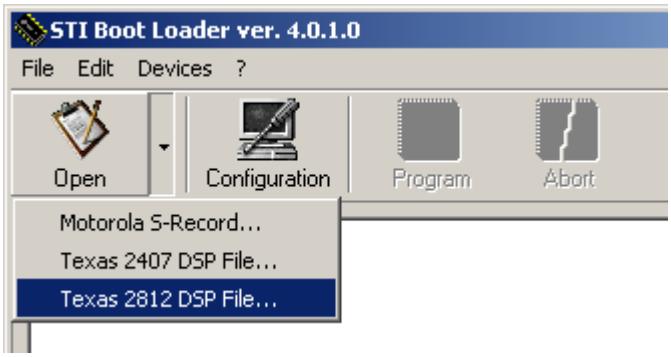


2.2.1 DSP software installation

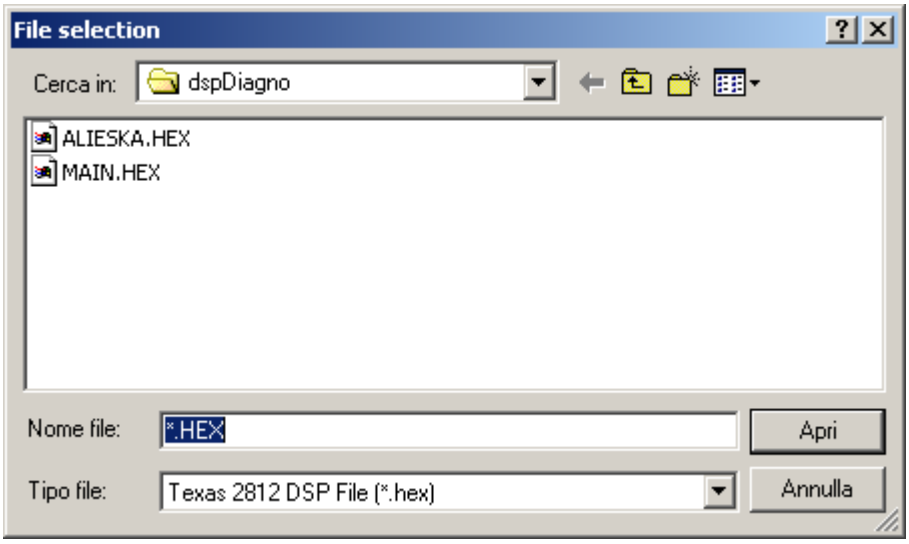
Copy the DSP software to be installed to a folder on the laptop. File extension should be ".hex".
Perform the following steps on the QuickTrak III controller to prepare it for software loading.

- Turn off the controller by the main power switch.
- Change the switches SW5 as showed in SW Upgrade mode (see on the board).

- Attach the RS 232 9 pin cable to the J9 connection block (Com DSP).
- Launch the loader program as in §2.2.
- Select the down arrow next to the “OPEN” quick select button.



- Select “Texas DSP File”
- Locate the .HEX file, and select OPEN



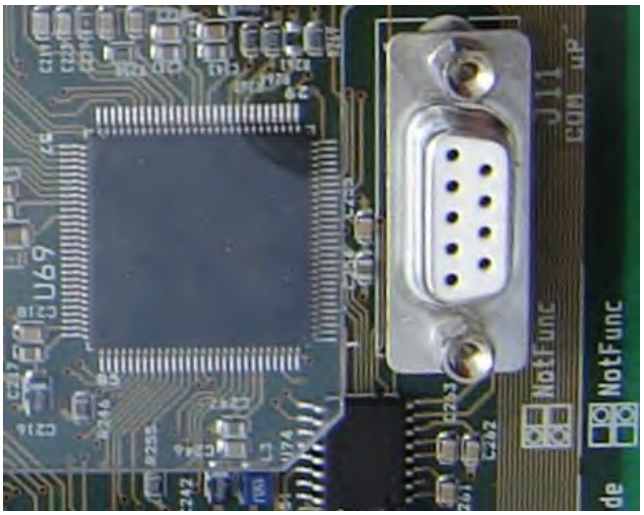
- Turn on the controller
- Select the “Program” quick select button

- The program should run to completion
- Upon completion select File » Exit
- Turn off the controller
- Change the switches SW5 as showed in Normal mode (see on the board).

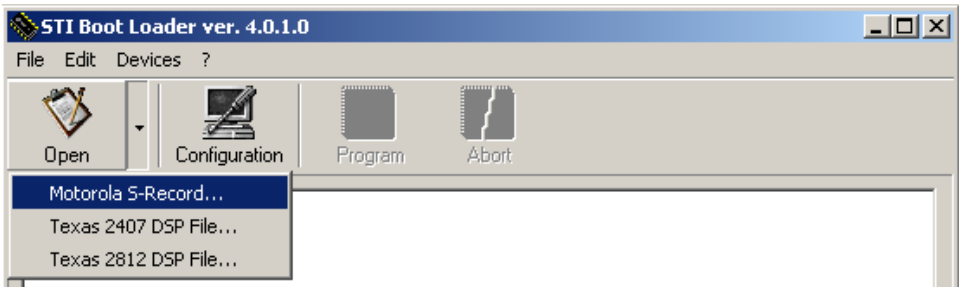
2.2.2 HC12 software installation

Copy the HC12 software to be installed to a folder on the laptop. File extension should be “.s19”. Perform the following steps on the QuickTrak III controller to prepare it for software loading.

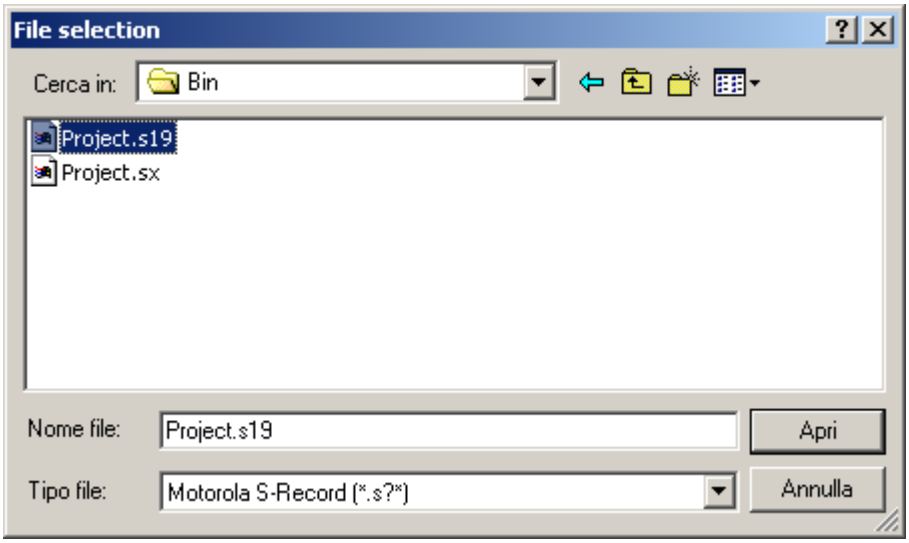
- Turn off the controller by the main power switch.
- Attach the RS 232 9 pin cable to the J11 connection block (COM µP).



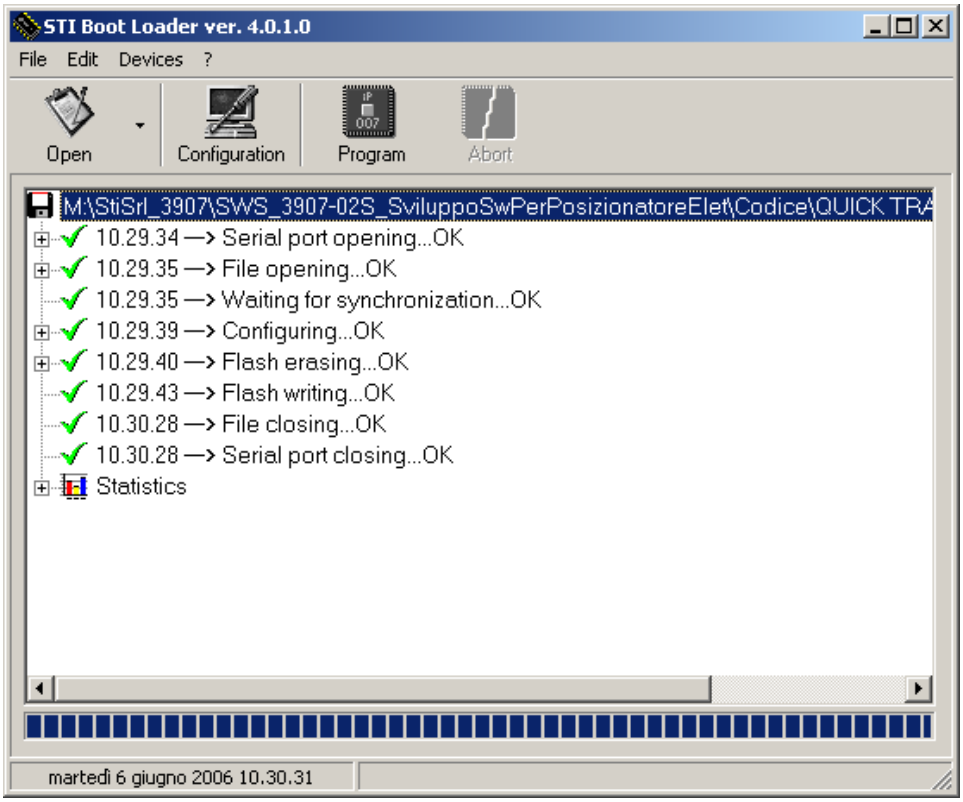
- Launch the loader program.
- Select the down arrow next to the “OPEN” quick select button and choose “Motorola S- Record”.



- Locate the .S19 file and select OPEN.



- Select the “Program” quick select button.
- Turn on the controller.
- The program should run to completion.



- Upon completion select File » Exit.
- Turn off the controller.

3 DESCRIPTION OF THE MENU

An easy interface for the user is provided for the management and configuration of the system. The interface is performed by the following devices: one main menu, many submenus and linked pages.

The structure of the menu is displayed in the following picture:

I. MAIN

II. SYSTEM INFO

III. SYSTEM SET UP

- III.1 TRAVEL CONTROL
- III.2 TUNING
- III.3 INPUT CHAR.
- III.4 INPUTS
- III.5 OUTPUTS
- III.6 RESET COMMAND

IV. CALIBRATION

- IV.1 PROBE CONSTANT
- IV.2 CALIBRATION
- IV.3 SYSTEM CALIBRATED

V. COMMAND MODE

- V.1 SERVICE OUT / IN
- V.2 MANUAL

VI. FAIL & TRIP SETTING

- VI.1 SOV CONFIGURATION
- VI.2 POSITION EXCESS FAIL MODE
- VI.3 POWER FAIL MODE
- VI.4 SIGNAL FAIL MODE
- VI.5 PRESSURE FAIL MODE
- VI.6 MODE FOR TRIP1
- VI.7 MODE FOR TRIP2
- VI.8 MODE FOR TRIP3
- VI.9 MODE FOR TRIP4

VII. GENERAL SETTING

- VII.1 MEASUREMENT UNITS MET / IMP
- VII.2 LANGUAGE
- VII.3 DATE & TIME
- VII.4 PASSWORD
- VII.5 CONTRAST

VIII. SYSTEM DATA

- VIII.1 TE
- VIII.2 VI

IX. COMMUNICATION

- IX.1 HART PROTOCOL 6.0

X. DIAGNOSTIC

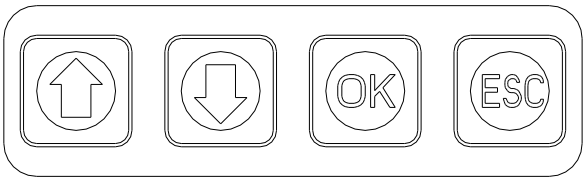
- X.1 STROKE KM
- X.2 IN SVC HOURS
- X.3 MIN TEMP.
- X.4 MAX TEMP.
- X.5 AVER.TEMP.
- X.6 PERM.TIME
- X.7 dP UP-DOWN
- X.8 ERROR STAT
- X.9 CALIB STAT
- X.10 OUT SVC STAT

X.11 IN SVC STAT
X.12 STAT FREQ

XI. ADVANCED

XI.1 DIAGNOSTIC DATA
XI.2 PROBE TYPE
XI.3 INTEGRAL
XI.4 PROP.GAIN MODE
XI.5 PROP.BAND GAIN
XI.6 PART NUMBER
XI.7 PASSWORD
XI.8 SET AS DEFAULT
XI.9 RESET STAT
XI.10 ERASE CALIB
XI.11 STAT DEBUG
XI.12 HART DEBUG
XI.13 PRESS.CALIB
XI.14 MOTOR TEST
XI.15 STEP MOTOR
XI.16 GEOMETRIC 0
XI.17 SPOOL LIMIT

The 4 keys provided (↑, ↓, OK, ESC) for the menus control, have the following function:

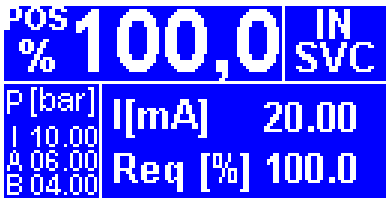


Key ↑ allows to shift on the option immediately preceding the one currently selected, enabling the menu shift in the counterclockwise direction up to the reaching of the first option.
Key ↓ allows to shift on the option immediately following the one currently selected, enabling the menu shift in the clockwise direction up to the reaching of the limit given by the last option.
the **OK** key confirms the option currently selected and activates the correspondent operation.
The **ESC** key (when enabled) allows to return to the previous menu.
The enabled keys are showed in reverse to help the operator's use of the interface, while the disabled keys are not pointed out.

3.1 MAIN

OK			MAIN
	ERR		To display the error page
	ESC		To display the user access page

The main page is displayed at the end of the device start up or by the operator's request.
It has the following format on the controller display:

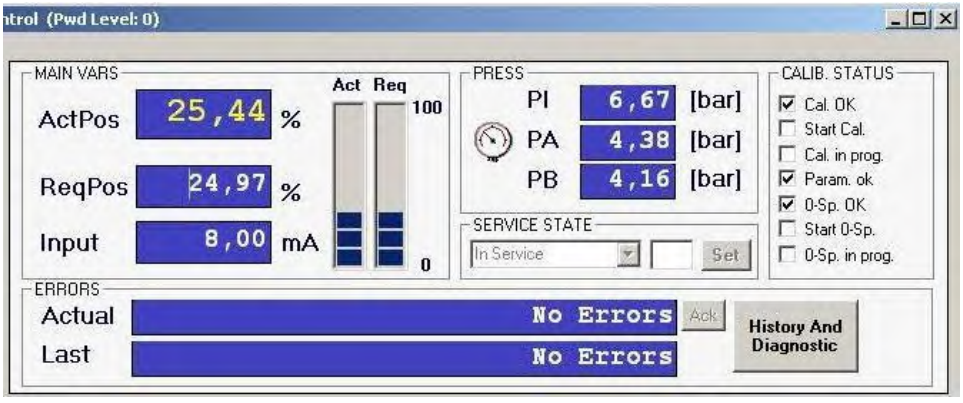


Selecting the MAIN page, the following main system information is displayed on the LCD monitor:

- OUT SVC or IN SVC
  System service state (out of service or in service)
- SUPPLY
  Supply pressure (at the servo valve inlet)
- PA
  Pressure in the first chamber (servo valve output port)
- PB
  Pressure in the second chamber (servo valve output port)
- INPUT
  Inlet signal current [mA]
- REQPOS
  Required Actuator Position [%]
- ACTPOS
  Actuator Position [%]

The active buttons in this page are ERR and ESC; ERR to enter the system error page and ESC to go to the user access page.

If a PC connection is active, on the screen this information is shown in the STATUS window.



3.1.1 ERROR PAGE

OK			MAIN
	ERR		MAIN
		OK	To return to main menu
		ESC	To return to main menu

When ERR button is pushed from the main page the information referred to the present alarm (ERROR CONDITION) and the last detected alarm (LAST ERROR CONDITION) are showed.

ERROR CONDITION: ……..
LAST ERROR CONDITION: ……
PRESS ESC/OK TO EXIT

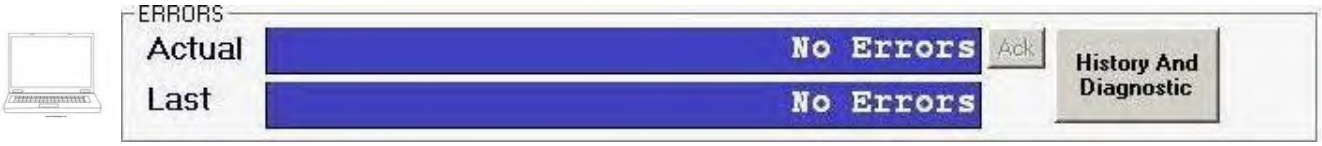
In normal operation condition (no error or fail conditions), the error description showed is NONE.
The errors analyzed by the system are:

0	NONE	There are no active errors
1	TRIP 1	The trip 1 function is active
2	TRIP 2	The trip 2 function is active
3	TRIP 3	The trip 3 function is active
4	TRIP 4	The trip 4 function is active
E05	PRESSURE FAIL	Pressure supply is lower than the selected pressure limit
E06	LOW SIGNAL FAIL LIMIT	The inlet signal supply is lower than the selected low signal limit
E07	HIGH SIGNAL FAIL LIMIT	The inlet signal supply is higher than the selected high signal limit
E08	POSITION EXCESS ERROR	The difference between required and actual position, exceeds selected error values
E09	POSITION EXCESS WARNING	The difference between required and actual position, exceeds selected warning values
E10	PROBE ERROR	The probe is not working properly
E11	LOW POWER FAIL	The power is lower than the selected low power limit
E12	HARD LIMITS ERROR	The actuator hard limits have been found invalid during the calibration routine
E13	DSP TIMEOUT	There is no communication between HC12 and DSP cards
E14	WATCH DOG ERROR	The watchdog circuit has detected a malfunction on the DSP card
E15	HIGH POWER FAIL	The power is higher than the selected high power limit
E16	ERROR ON SOLENOID VALVE SOV1	Malfunction detected on SOV1 valve: valve is disconnected or circuit is interrupted (no current detected in the circuit)
E17	ERROR ON SOLENOID VALVE SOV2	Malfunction detected on SOV2 valve: valve is disconnected or circuit is interrupted (no current detected in the circuit)
E18	ERROR ON SOLENOID VALVE SOV3	Malfunction detected on SOV3 valve: valve is disconnected or circuit is interrupted (no current detected in the circuit)
E19	DSP RESTART	The DSP has been improperly restarted
E20	CALIBRATION ERASED	Warning message used in order to inform that a calibration parameters reset has been performed by the operator
E21	EEprom Error 0	Internal error on display electronic board
E22	EEprom Error 1	Internal error on display electronic board
E23	HC12 RESTART	The HC12 has been improperly restarted
E24	EEprom Ext Error 0	Internal error on display electronic board
E25	EEprom Ext Error 1	Internal error on display electronic board
E26	Probe Out of Range	The probe is reading -10% or 110%

E31	CALIBRATION ABORTED	It's a warning message. It informs that calibrations has been aborted due to another error (Pressure, trips, probe..)
E32	ZERO SPOOL ERROR	It happens when system is not able to find hard limit of the spool
E33	ZERO SPOOL SEARCHING	It's a warning message. It informs that the system is searching the origin
E34	SPOOL LIMIT ERROR	The spool hard limits seems not correct (probably due to a friction problem)
E35	FRICTION WARNING	The "excess friction warn" message is displayed when 1000 steps are lost on a train of 5000 steps
E36	ENCODER ERROR	It happens when more than 300 steps in the same direction without any movement
E37	FRICTION ERROR	While an "excess friction fail" message is shown when 4000 steps on a train of 5000 steps are lost
E38	ENCODER INDEX ERROR	Encoder index is not found during calibration process.
E39	ENCODER INDEX 2 ERROR	Encoder index is not found when the controller is switched on.
E41	WAITING ACK	The system is waiting for the error acknowledgment, performed by the user
E42	EXTERNAL SOV WARNING	Used only in case of trip connected to external SOV (and error mode for trip equal to EXTERN. SOV) Warning message used in order to inform that an external safety shut down valve has been activated
E43	SYSTEM VERSION ERROR	The DSP SW version is not compatible with the HC12 SW version

Press indifferently ESC or OK to return to the main menu.

On the PC screen, that information is shown under the STATUS window.



3.1.2 USER ACCESS PAGE

It's necessary to type the user password in order to enter into the system from the local panel.

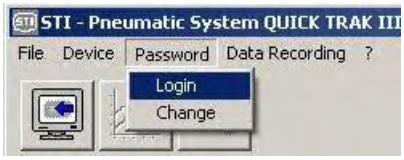
PASSWORD: *****

The device is supplied by the manufacturer with the default password: [OK ↑ ↓ ↑ ↓].

At the end of the login phase, the main menu will appear on the screen:

MAIN
SYSTEM INFO
SYSTEM SET UP
CALIBRATION
COMMAND MODE
FAIL & TRIP SETTING
GENERAL SETTING
SYSTEM DATA
COMMUNICATION
DIAGNOSTIC
ADVANCED

On the PC, a sequence of alfa-numerical digits is required (default is 12345) to access the system in remote mode.
To access to the password request there are to options:



OR

3.2 SYSTEM INFO

↓			**MAIN**
OK			**SYSTEM INFO**
	OK		To return to main menu
	ESC		To return to main menu

In this page the system part number and the software revisions are displayed.

PART NUMBER ……
HC12 SW VERS. ……
DSP SW VERS. ……
PLD VERS. ……..
HART REVISION 6.0
DEV. REVISION ……

The **part number** is the instrument serial number and it corresponds in the HART Protocol to the Device ID.
The **HC12 µprocessor SW version** is the number corresponding to the SW release currently loaded on the QuickTrak controller.
The **DSP µprocessor SW version** is the number corresponding to the SW release currently loaded on the QuickTrak controller.
The **PLD SW version** is the number corresponding to the SW release currently loaded on the QuickTrak controller.
The **HART Universal Revision Number** is a whole number indicating the HART major revision level supported by the field device.
The **Device Revision Number** defines the revision level of the command set supported by the field Device, including the device-specific commands.

3.3 SYSTEM SET UP

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	ESC		To return to main menu

By a sub-menu contained in this menu level, it's possible to adjust the main positioner functions.

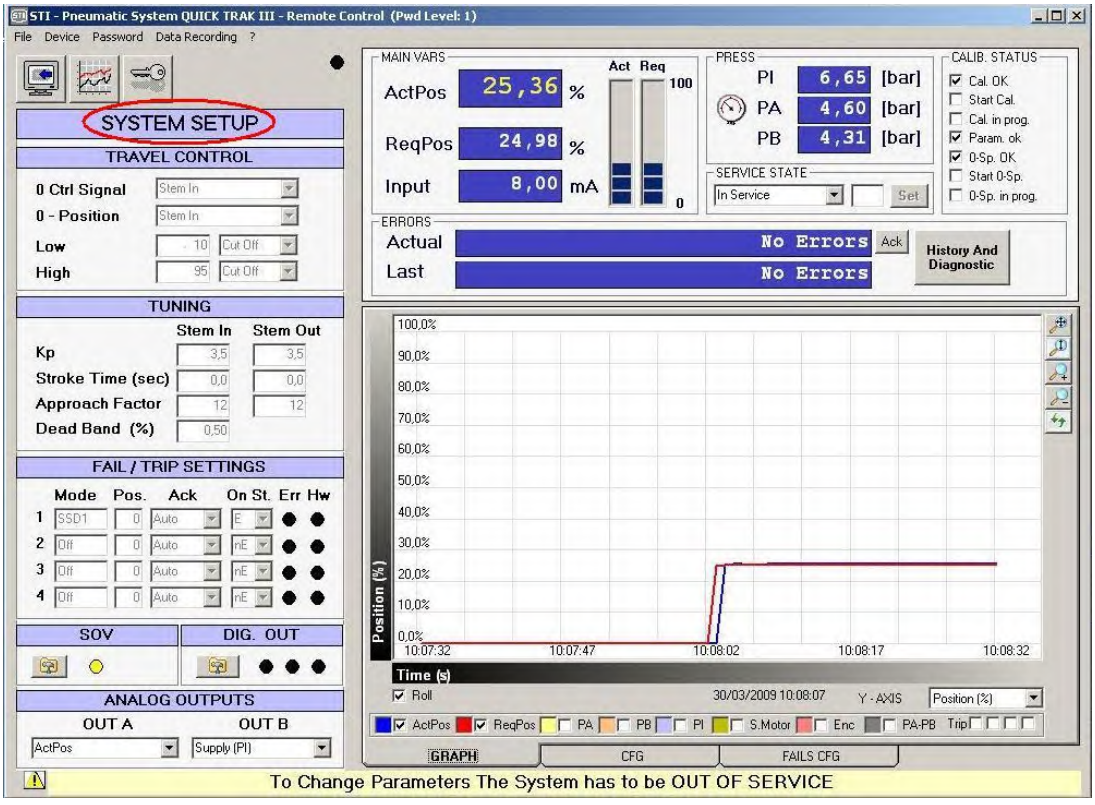
ATTENTION: The system must be put into "out of service" in order to perform the "set up". Please refer to chapter COMMAND MODE.

CAUTION: When the system is "out of service" any parameters' modifications can cause a movement of the actuator. Before making any changes, make sure that the plant and personnel are in a safe state to allow these movements.

On the LCD monitor, the following menu is displayed:

TRAVEL CONTROL
TUNING
INPUT CHAR.
INPUTS
OUTPUTS
RESET COMMAND

On the PC screen, that information is shown under the SYSTEM SETUP window.



3.3.1 TRAVEL CONTROL

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	OK		**TRAVEL CONTROL**
		ESC	To return to menu

With this set of commands, it is possible to configure the action of the actuator and special travel functions as limits or cut off functions.

On the LCD monitor, the following menu is displayed:

0 CTRL SIGNAL STEM ↑ / ↓
0 POSITION STEM ↑ / ↓
LTRAVEL POS.
LTRAVEL MODE OFF
HTRAVEL POS.
HTRAVEL MODE OFF

With the keys ↑ / ↓, it is possible to shift on the demanded line, and pushing the OK button, it is possible to change the function. The active selection will come out in reverse. The possible options for the low and high travel control mode are: OFF, LIMIT, CUT OFF.

3.3.1.1 0 CTRL SIGNAL

With this command, it is possible to select the position of the actuator stem corresponding to the 0 signal (4 mA).

KEY ↑ ("Stem in", in the PC software) → Actuator stem retracted at 4 mA
KEY ↓ ("Stem out", in the PC software) → Actuator stem extended at 4 mA

With keys ↑ / ↓, it is possible to shift on the demanded line and pushing the OK button it is possible to change the function. The active selection will come out in reverse.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

3.3.1.2 0 POSITION

With this command, it is possible to select the position of the actuator stem corresponding to the 0 output signal (0%).

KEY ↑ ("Stem in", in the PC software) → Actuator stem retracted at 0%
KEY ↓ ("Stem out", in the PC software) → Actuator stem extended at 0%

With keys ↑ / ↓, it is possible to shift on the demanded line and pushing the OK button it is possible to change the function. The active selection will come out in reverse.

3.3.1.3 LOW TRAVEL POSITION

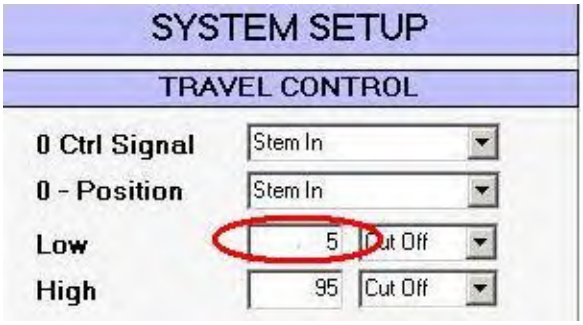
With this command, it is possible to define the low travel position for the actuator. The following information is displayed:

LTRAVEL POS.
5.0 %
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ and subsequently confirmed with OK. Press ESC to return to the previous menu.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC, this function can be activated with the introduction of the value in the cell corresponding to the “low limit”.



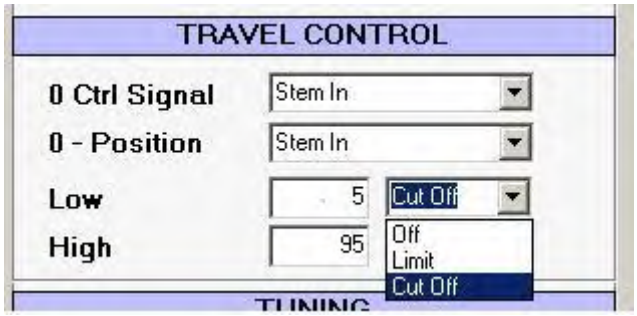
3.3.1.4 LOW TRAVEL MODE

With this command, it is possible to select the low travel control mode (OFF, LIMIT, CUT OFF).
With the keys ↑ / ↓, it is possible to shift on the demanded line and pushing the OK button it is possible to change the function. The active selection will come out in reverse.

Select OFF to disable the travel control function.
Select LIMIT to impose a software travel limit to the lower side of the actuator stroke.
Select CUT OFF to impose a software cut off limit to the lower side of the actuator stroke.
With CUT OFF function the actuator provides full thrust, that is one of the actuator’s chamber is pressurized with max pressure value (air supply pressure) and the other is vented to the atmosphere.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC, this function can be activated with the selection of the option corresponding to the low travel control mode.



3.3.1.5 HIGH TRAVEL POSITION

With this command, it is possible to define the high travel position for the actuator. The following information is displayed:

HTRAVEL POS.
95.0 %
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ and subsequently confirmed with OK. Press ESC to return to the previous menu.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC this function can be activated with the introduction of the value in the cell corresponding to the “high limit”.

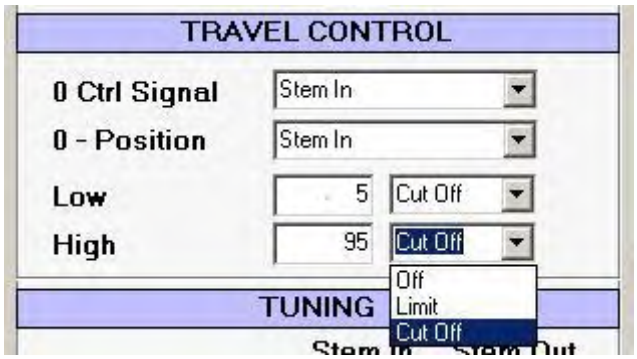
3.3.1.6 HIGH TRAVEL MODE

With this command, it is possible to select the high travel control mode (OFF, LIMIT, CUT OFF).
With the keys ↑ / ↓, it is possible to shift on the demanded line and pushing the OK button it is possible to change the function. The active selection will come out in reverse.

Select OFF to disable the travel control function.
Select LIMIT to impose a software travel limit to the higher side of the actuator stroke.
Select CUT OFF to impose a software cut off limit to the higher side of the actuator stroke.
With CUT OFF function the actuator provides full thrust, that is one of the actuator’s chamber is pressurized with max pressure value (air supply pressure) and the other is vented to the atmosphere.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC, this function can be activated with the selection of the option corresponding to the high travel control mode.



3.3.2 TUNING

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	↓		**TRAVEL CONTROL**
	OK		**TUNING**
		ESC	To return to menu

With this set of commands, it's possible to configure the positioner response parameters such as gain, integral function and dead band.

Selecting this function, the following menu is displayed:

PROPORTIONAL GAIN
SPEED CONTROL
DEAD BAND

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

3.3.2.1 PROPORTIONAL GAIN

With this command, it is possible to enter into a sub-menu:

PROP.GAIN STEM ↓ 3.5
PROP.GAIN STEM ↑ 3.5

Proportional gain is the multiplier of the error (difference between input signal and actuator actual position) and it is expressed in percent. It is active only for an error which is bigger than dead band value.
A different gain for each stem direction can be imposed.

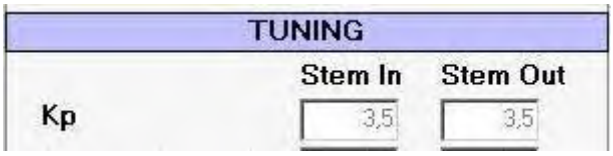
With the OK command selection, it is possible to enter into the parameter change page for the selected line (actuator stem direction) and modify the displayed value:

PROP.GAIN STEM ↓ (or STEM ↑)
3.5
PRESS OK TO CONFIRM

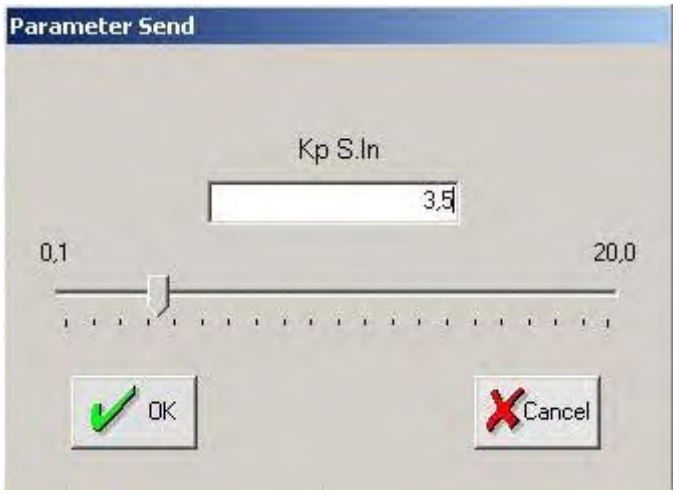
The second line value can be changed by pressing the key ↑ / ↓ and subsequently confirmed with OK. Press ESC to return to the previous menu.

WARNING: A wrong proportional gain value can generate actuator instability.

On the PC software, this parameter is called “Kp” and two cells are available (one for each direction) in “double” gain mode.



To set the value, double click on the selected cell and, the following window will appear:



Insert the value and press “SEND” to confirm it or “Cancel” to exit.

WARNING: A wrong proportional gain value can generate actuator instability.

3.3.2.2 SPEED CONTROL

With this command, it is possible to modify stroke speed parameters. Selecting this command the following sub-menu is shown:

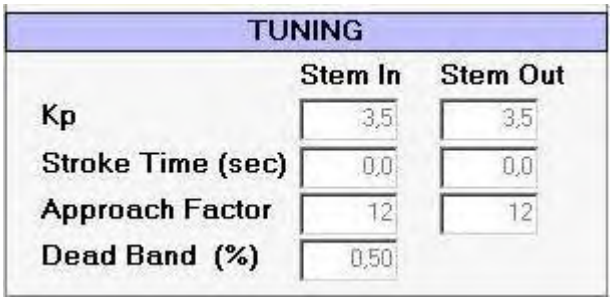
STROKE TIME ↓ 0
STROKE TIME ↑ 0
APPROACH FACTOR ↓ 12
APPROACH FACTOR ↑ 12

STROKE TIME is the value expressed in seconds of the stroking time for each direction (from 0% to 100%).
APPROACH FACTOR is a “damping” coefficient to be increased in order to avoid any overshooting when the actuator approaches the target position.
It can be set in a range between 0÷100 (0 = no control, 100 = maximum control). With the OK command selection, it is possible to enter the parameter change page for the selected line (actuator stem direction) and modify the displayed value:

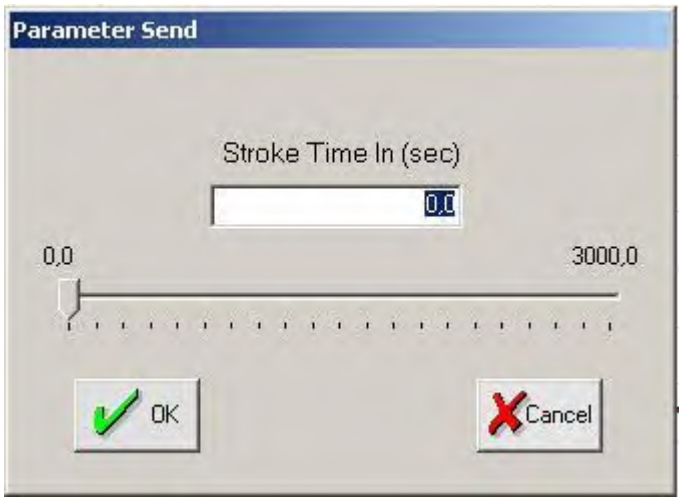
STROKE TIME ↓ (or ↑) APPROACH FACTOR ↓ (or ↑)
0
APPROACH FACTOR ↓ (or ↑)
12
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC software, those values are in the TUNING window.



To set the value, double click on the selected cell and the following window will appear:



Insert the value and press “SEND” to confirm or “Cancel” to exit.

☞	**CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.**

3.3.2.3 DEAD BAND

With this command, it is possible to modify the dead band value. Dead band prevents (at expense of the accuracy) that the valve, in the controlled condition, keeps continuously hunting for the target position.

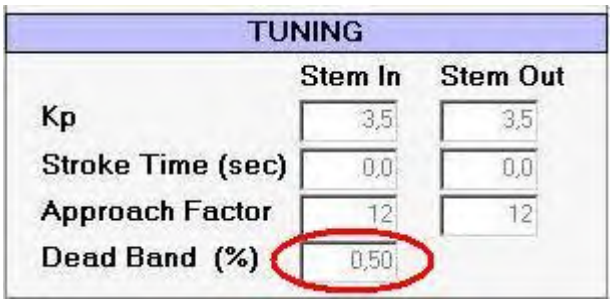
DEAD BAND
0.50
PRESS OK TO CONFIRM

It is expressed in terms of a total stroke percentage in a range of 0.05%÷20%.

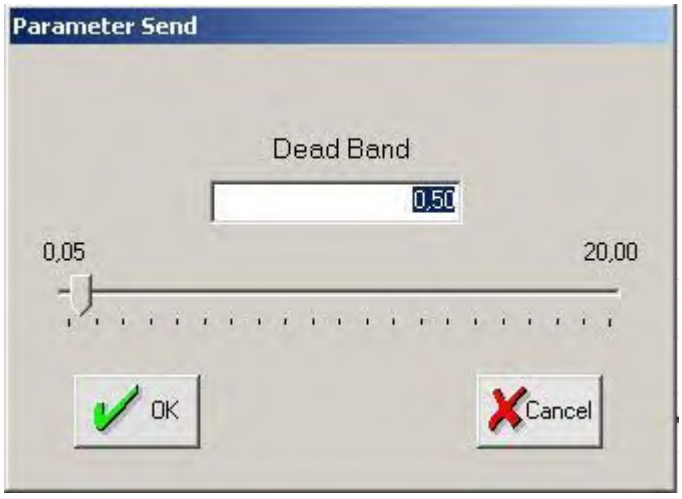
WARNING: A wrong dead band value can generate actuator instability.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC software, a single cell is available to modify the dead band value.



To set the value, double click on the cell, the following window will appear:



Insert the value and press “SEND” to confirm or “Cancel” to exit.

3.3.3 INPUT CHARATERISTIC

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	↓		**TRAVEL CONTROL**
	↓		**TUNING**
	OK		**INPUT CHAR.**
		ESC	To return to menu

With those commands, it is possible to configure the relationship between the input signal and valve position set.

Selecting this function on the display, the following menu appears:

POSITION MODE LINEAR (or CUSTOMER)
CUSTOMER TABLE

In the first line, it's possible to move from linear to customer options (and vice versa) with the OK command. On the second line, with OK selection, it's possible to enter the changing point values page of the customer curve.

TABLE	**01**/03
SET POINT	TRAV.TARGET
0.0	**0.0**
10.0	**10.0**
20.0	**20.0**
30.0	**30.0**

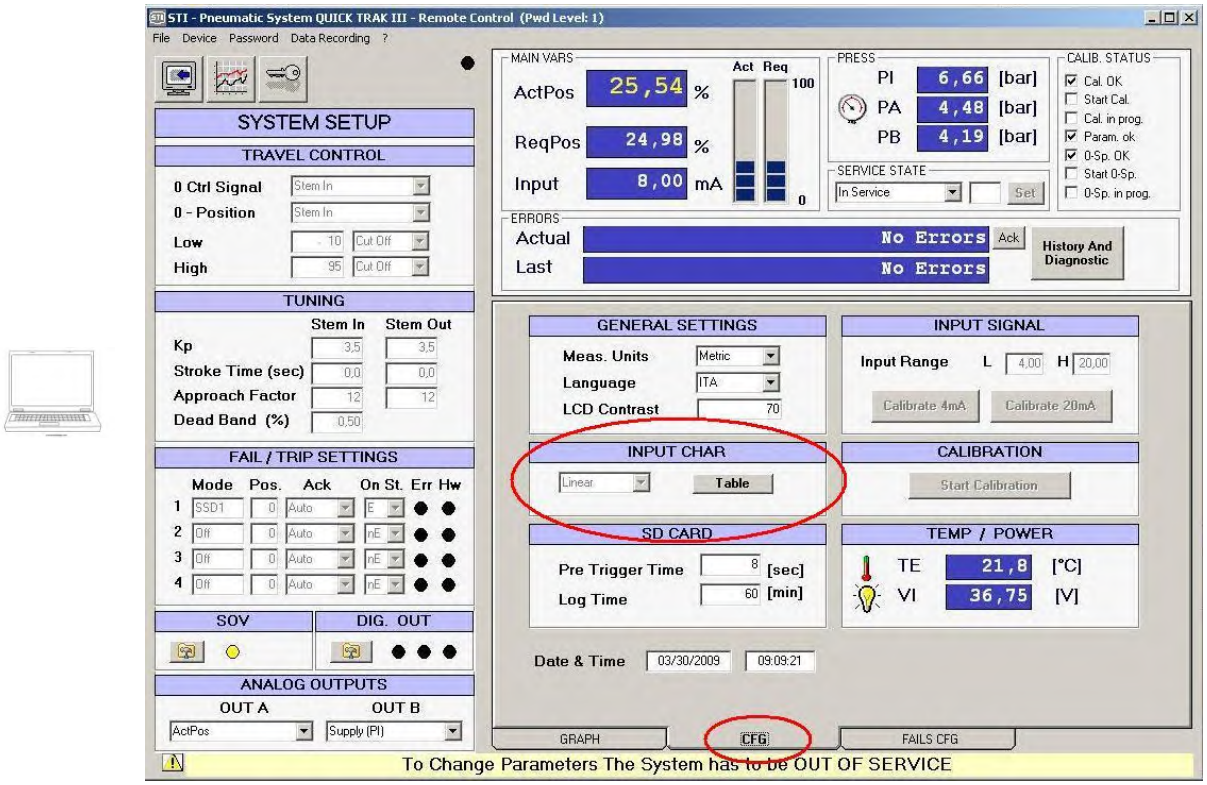
In the first line, the current page is indicated, in the second line there are the column titles. In the following lines, there are: the position and the corresponding parameter values.
The active field will come out in reverse. With the OK selection, it's possible to change the active data field. With the ↑ / ↓ commands, it's possible to modify all the available parameters.
Changing the page number, it's possible to scroll the customer table.

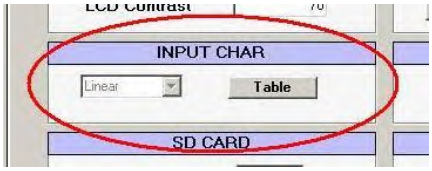
TABLE	**02**/03
SET POINT	TRAV.TARGET
40.0	**40.0**
50.0	**50.0**
60.0	**60.0**
70.0	**70.0**

TABLE	**03**/03
SET POINT	TRAV.TARGET
80.0	**80.0**
90.0	**90.0**
100.0	**100.0**

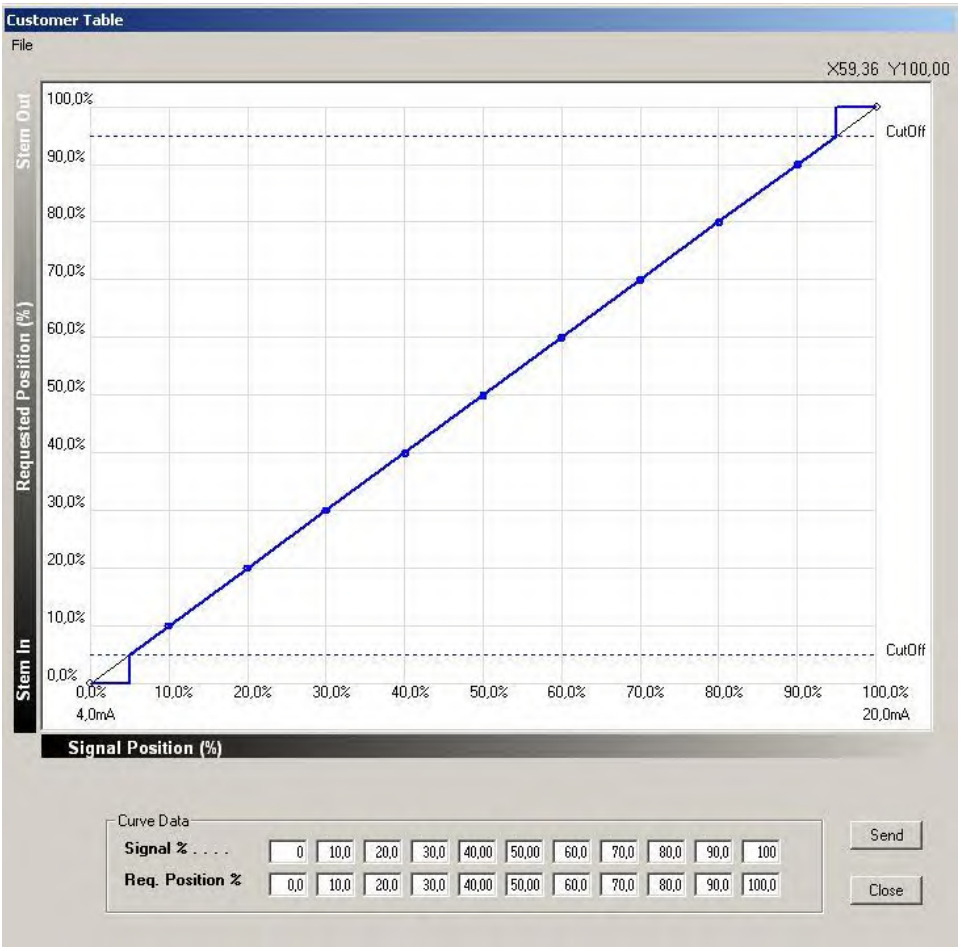
CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC software is possible to select the curve type form the “INPUT CHAR” window that is located in “**CFG**” label:





In case of “Customer Curve” selection, pushing the “Table” button, it’s possible to display the entire curve. From this page, it’s possible to modify the point values inserting the value into the cell or trailing the point position on the graph with the mouse.



Press “SEND” to confirm the values or “CLOSE” to exit from this window. In order to use the transfer curve modified remember to select “Customer” instead “Linear” in INPUT CHAR window.

3.3.4 INPUTS

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	↓		**TRAVEL CONTROL**
	↓		**TUNING**
	↓		**INPUT CHAR.**
	OK		**INPUTS**
		ESC	To return to menu

With this set of commands, it’s possible to configure the zero inlet signal and span.

Selecting this function, the following menu appears on the display:

INPUT RANGE L XX.XmA
INPUT RANGE H XX.XmA
CALIBRATE 4.0mA
CALIBRATE 20.0mA

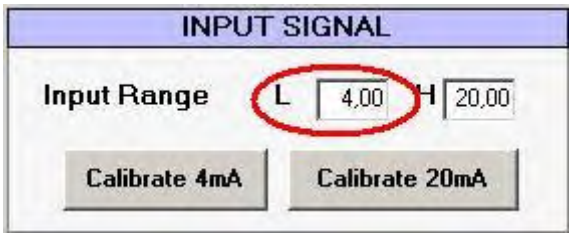
3.3.4.1 INPUT RANGE LOW

With this command, it's possible to set the lower range limit for the input signal.

INPUT RANGE LOW
4.0 mA
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ in a range between 0.0÷10.0 mA and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC software, it's possible to insert the required value into the "Input Range L" cell in the INPUTS window.



To set the value, double click on the selected cell and press "SEND" to confirm or "ABORT" to exit from this window.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

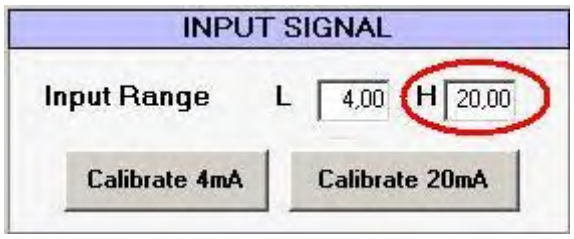
3.3.4.2 INPUT RANGE HIGH

With this command, it's possible to set the upper range limit for the input signal.

INPUT RANGE HIGH
20.0 mA
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ in a range of between 10.0÷30.0 mA and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC software, it is possible to insert the required value into the “Input Range H” cell in the INPUTS window.



To set the value, double click on the selected cell and press “SEND” to confirm or “ABORT” to exit from this window.

	CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

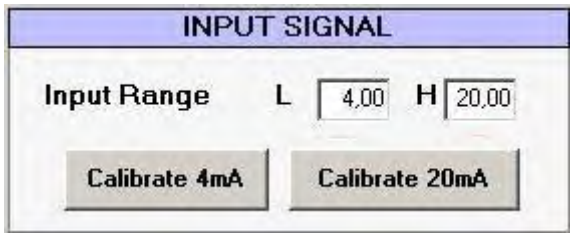
3.3.4.3 CALIBRATE 4 mA or 20 mA

With this command, it’s possible to calibrate the 4mA (or 20 mA) in order to set the input signal.
A confirmation is required in order to start the 4mA/20mA calibration routine:

CALIBRATE 4.0mA ? or CALIBRATE 20.0mA ?

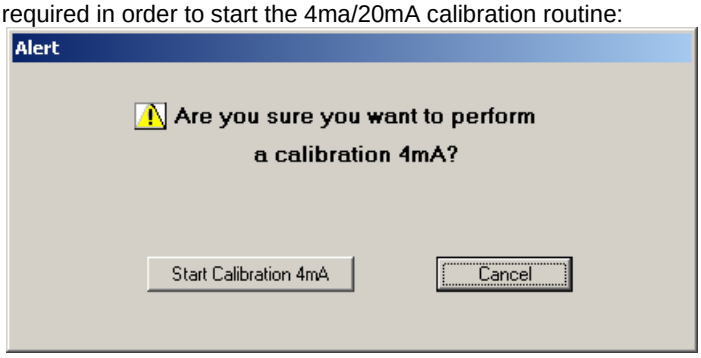
PRESS OK TO CONFIRM

On the PC software, is possible calibrate the two points by pushing the “Calibrate 4mA” and “Calibrate 20mA” buttons.



	CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

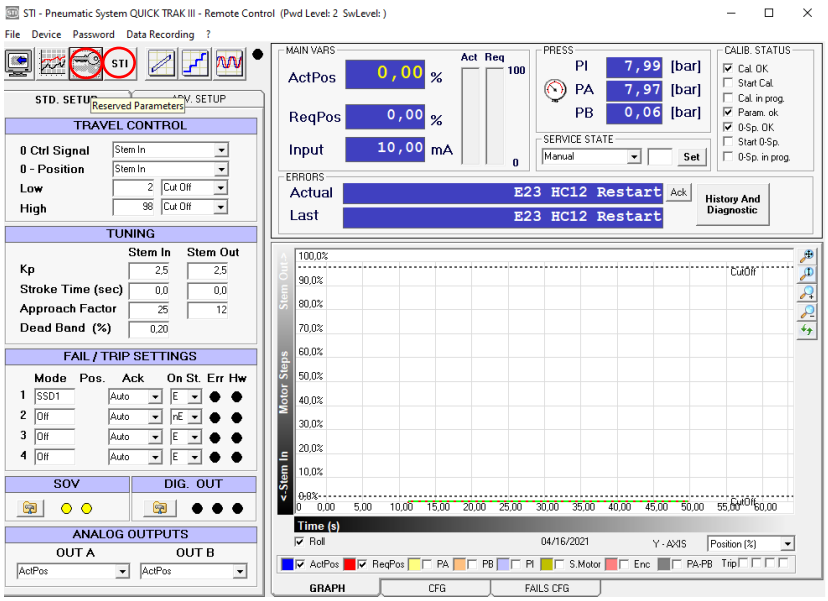
A confirmation is required in order to start the 4ma/20mA calibration routine:



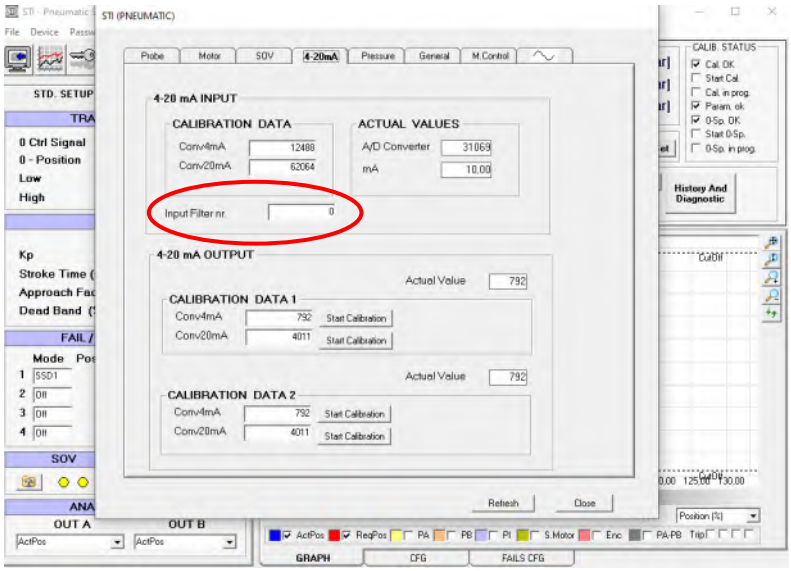
3.3.4.4 SETPOINT INPUT FILTER CONFIGURATION

This feature allows to configure the input filter applied on the setpoint signal.
Usually the QuickTrak is used in very fast application but sometimes it is necessary to apply a filter on the setpoint to avoid to follow the noise coupled on the signal or coming from the process sensors.

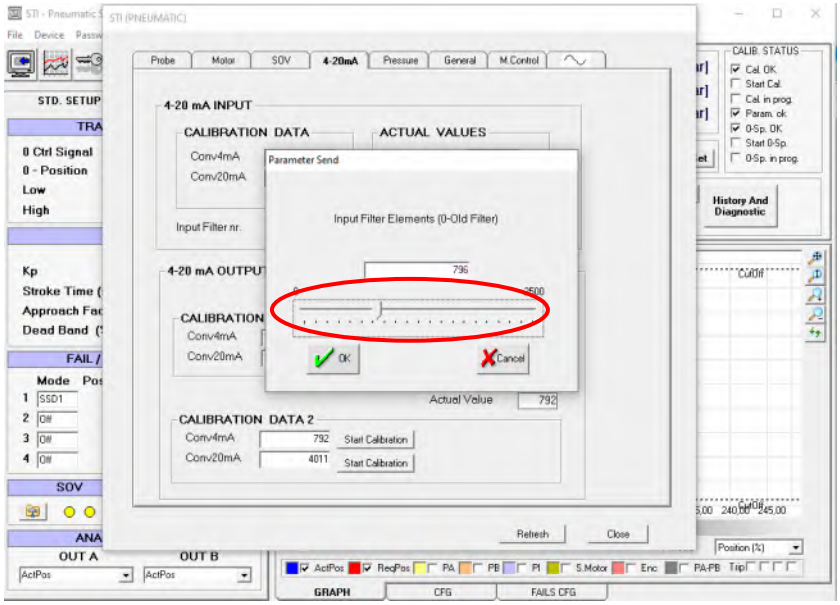
On the PC software is possible to modified the filter setpoint.
Press the key and put the second level password.



The parameter “INPUT FILTER NR” in the advanced STI panel can assume the values:
0 = old style filter (like in the previous sw releases)
1.2500 = simplified moving average filter



Press two times quickly “Input Filter nr.”:



Set the parameter by the sliding arrow.
When a number between 1 and 2500 is specified a moving average filter (sampling time 1ms, length of the moving average equal to the configured value) is used.
A low value meand a low filter effect, a big value means a strong filtering.

3.3.5 OUTPUTS

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	↓		**TRAVEL CONTROL**
	↓		**TUNING**
	↓		**INPUT CHAR.**
	↓		**INPUTS**
	OK		**OUTPUTS**
		ESC	To return to menu

With this set of commands, it’s possible to configure the available output channels.

Selecting this function on the display, the following menu appears:

ANALOG OUTPUT A
ANALOG OUTPUT B
DIGITAL OUTPUT1
DIGITAL OUTPUT2
DIGITAL OUTPUT3

3.3.5.1 ANALOG OUTPUT

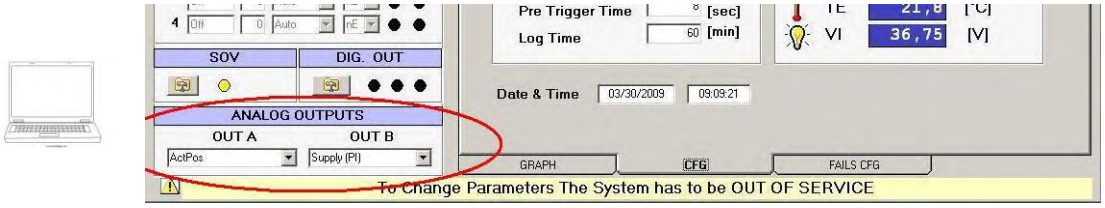
When ANALOG OUTPUTs (A or B) are selected with the OK key, it’s possible to enter the available analog output parameters page:

REQPOS	OFF/ON (required position, between 4÷20 mA)
ACTPOS	OFF/ON (actuator position, between 4÷20 mA)
INPUT	OFF/ON (input signal, between 4÷20 mA)
OUT1	OFF/ON (chamber 1 pressure, between 0÷10 bar)
OUT2	OFF/ON (chamber 2 pressure, between 0÷10 bar)
PRESSURE DELTA	OFF/ON (pressure difference, between -5÷5 bar)

TE	OFF/ON (temperature, between 0÷100°C)
SUPPLY	OFF/ON (supply pressure, between 0÷10 bar)
VI	OFF/ON (inside control panel voltage, 0÷100 Vdc)

It's possible to choose the required parameter, in order to associate it to the selected output channel for the reproduction of the indicated signal in a range from 4mA to 20mA. Pressing OK to confirm the choice, the ON indication will be pointed out on the selected channel. Press ESC to return to the previous menu.

On the PC software, it's possible to impose the output parameter by its selection in correspondence of OUT A or OUT B.



Starting from Release 4.01 ONLY from PC software it is possible to select "User ActPos" that allow the user to have a special position feedback. The User ActPos offsets and gain are configurable in ***STI expert menu*** in probe label.

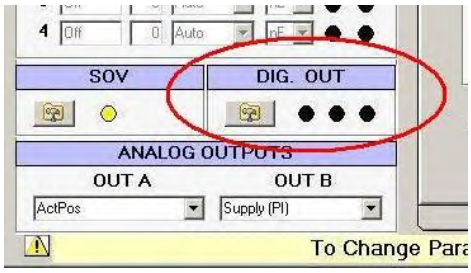
3.3.5.2 DIGITAL OUTPUT

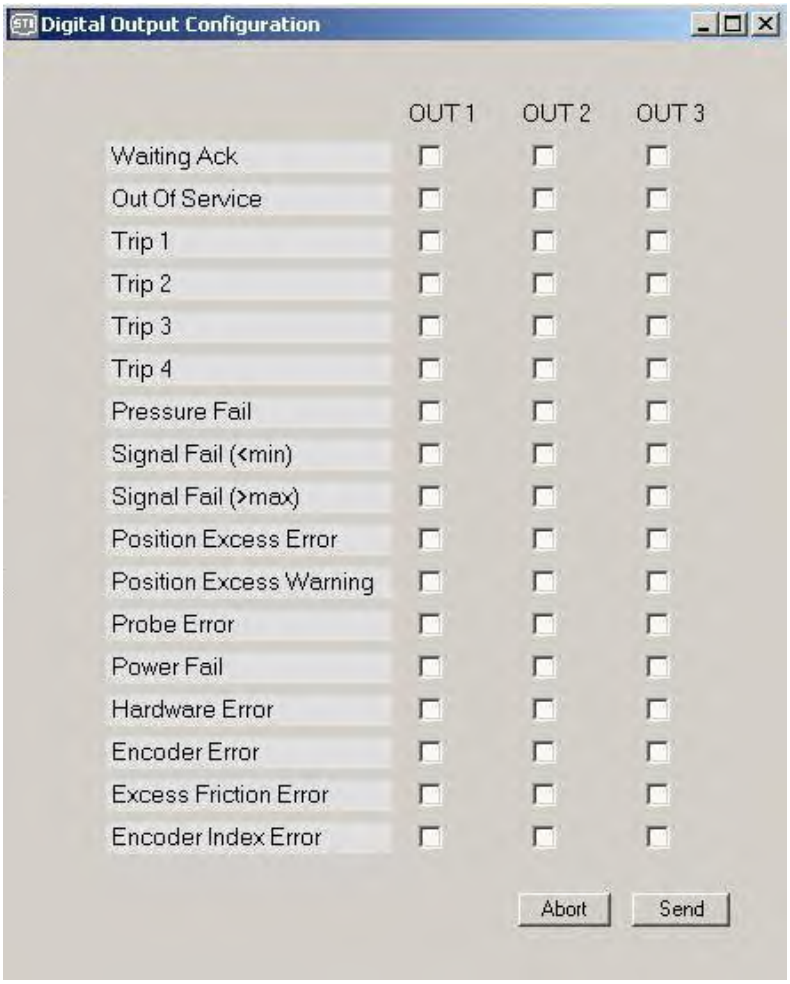
When DIGITAL OUTPUTs (1,2 or 3) are selected with the OK key, it's possible to enter into the available digital output parameters page:

WAITING ACK		OFF/ON
OUT SVC		OFF/ON
TRIP 1		OFF/ON
TRIP 2		OFF/ON
TRIP 3		OFF/ON
TRIP 4		OFF/ON
PRESSURE FAIL	LOW	OFF/ON
SIGN.FAIL		OFF/ON
HIGH SIGN.FAIL		OFF/ON
POS.EXC. ERROR		OFF/ON
POS.EXC. WARN.		OFF/ON
PROBE ERROR		OFF/ON
POWER FAIL		OFF/ON
HARDWARE ERROR		OFF/ON
ENCODER ERROR		OFF/ON
EXC.FRICT.ERR.		OFF/ON
ENC. INDEX ERR.		OFF/ON

It's possible to choose the required fail, warning or error activation, in order to associate it to the selected digital output channel. Pressing OK to confirm the choice, the ON indication will be pointed out on the selected channel. Press ESC to return to the previous menu.

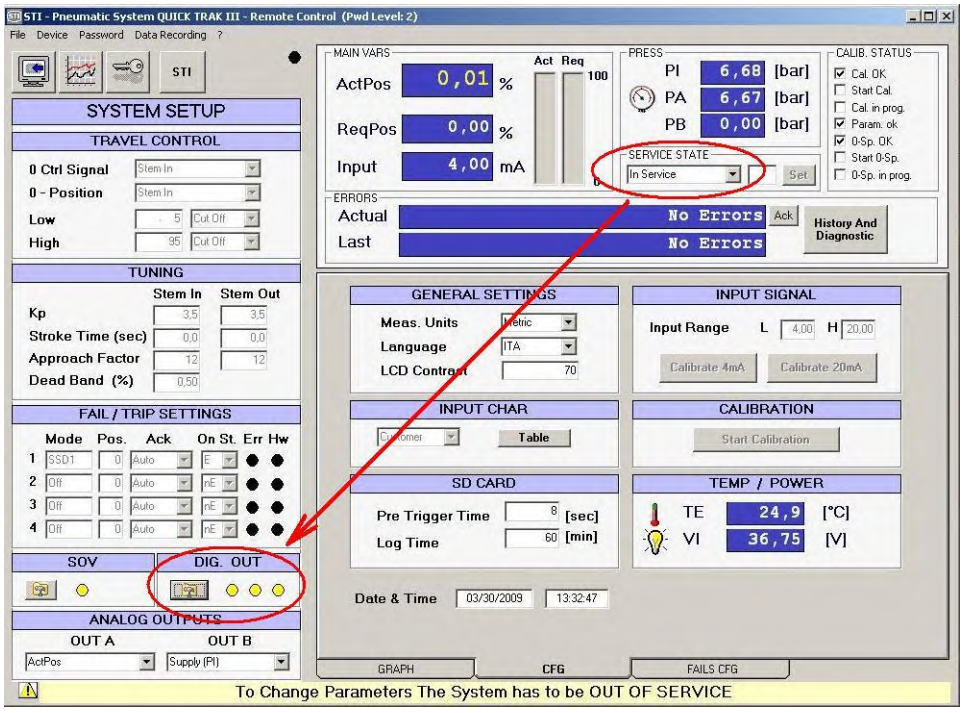
On the PC software, pushing the Dig. Out Config. button located in the DIG. OUT window, it's possible to impose the output parameter by its selection in correspondence of OUT 1, OUT 2 or OUT 3.

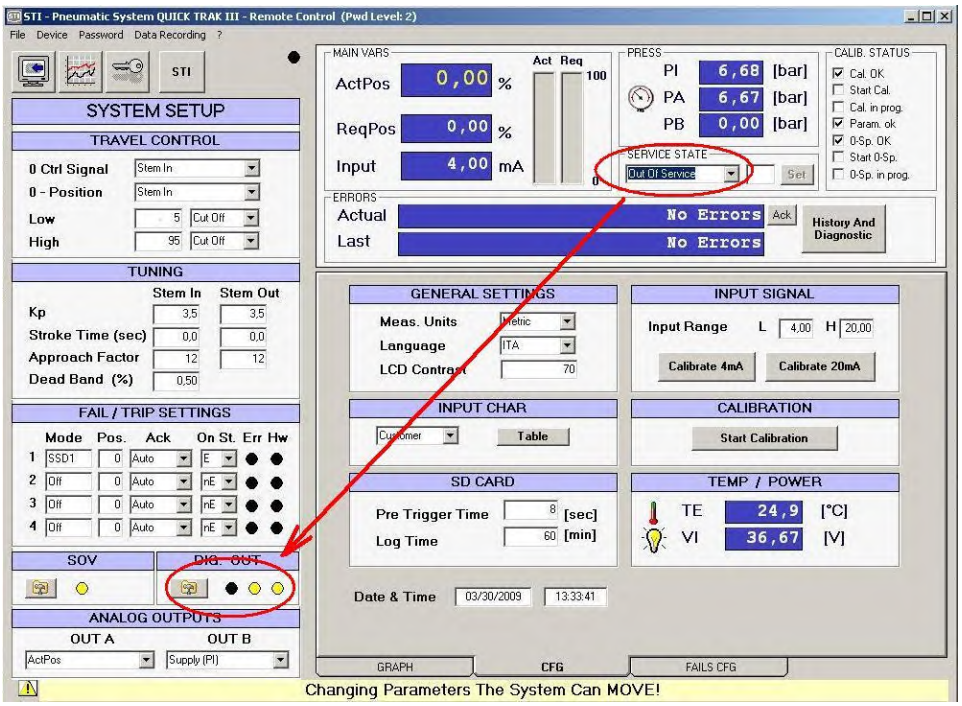




The status of OUT 1, OUT 2 and OUT 3 is shown in DIG OUT window. When a function is selected, the related output is deactivated when the event is true.

For example: Dig OUT1 is set on “Out of service” . When the service state is “In Service” the digital output 1 is activated, when the service state pass in “Out of service” the digital output 1 is turned off.




STI - Pneumatic System QUICK TRAK III - Remote Control (Pwd Level: 2)
File Device Password Data Recording ?
SYSTEM SETUP
TRAVEL CONTROL
0 Ctrl Signal
0 - Position
Low
High
TUNING
Stem In
Stem Out
Kp
Stroke Time (sec)
Approach Factor
Dead Band (%)
FAIL / TRIP SETTINGS
Mode Pos. Ack On St. Err Hw
SOV
DIG. OUT
ANALOG OUTPUTS
OUT A
OUT B
MAIN VARS
ActPos
ReqPos
Input
PRESS
PI
PA
PB
SERVICE STATE
CALIB. STATUS
ERRORS
Actual
Last
No Errors
History And Diagnostic
GENERAL SETTINGS
Meas. Units
Language
LCD Contrast
INPUT SIGNAL
Input Range
Calibrate 4mA
Calibrate 20mA
INPUT CHAR
Table
CALIBRATION
Start Calibration
SD CARD
Pre Trigger Time
Log Time
TEMP / POWER
TE
VI
Date & Time
GRAPH
CFG
FAILS CFG
Changing Parameters The System Can MOVE!

3.4 CALIBRATION

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
OK			**CALIBRATION**
	ESC		To return to main menu

With this selection is possible to activate the instrument calibration routine.

Before to perform a calibration it's suggested to *set to 1,0* the values of *Kp stem in* and *Kp stem out*.

If the customer tries to make a calibration when the system is "in service", the following message will be shown:

REFUSED REQUEST:
SVCSTATE MUST BE OUT!
PRESS ESC/OK TO EXIT

First step of the calibration is the setting (by means of ↑ / ↓ buttons) of the probe constant. This value is printed on the probe label.

PROBE CONSTANT
2800
PRESS OK TO CONFIRM

CAUTION: While the system is in calibration mode, the controller will move the cylinder (and process valve) automatically through various positions regardless of the state of the normal input command, including the fully open and fully close position. Before calibrating the system, make sure that the plant and personnel are in a safe state to allow these automatic functions.

Second step is the calibration confirmation:

CALIBRATION ?

PRESS OK TO CONFIRM

Once the calibration operation is confirmed with OK, the following page will be displayed on video:

SYSTEM CALIBRATION……..

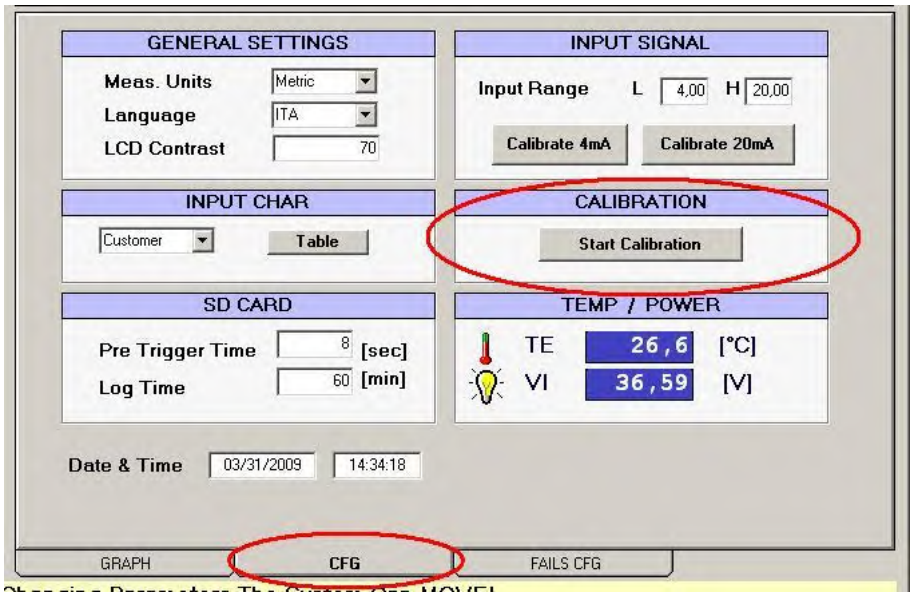
PLEASE WAIT

And it will remain active during the execution of calibration routine.
Once the operation is completed the following message is shown.

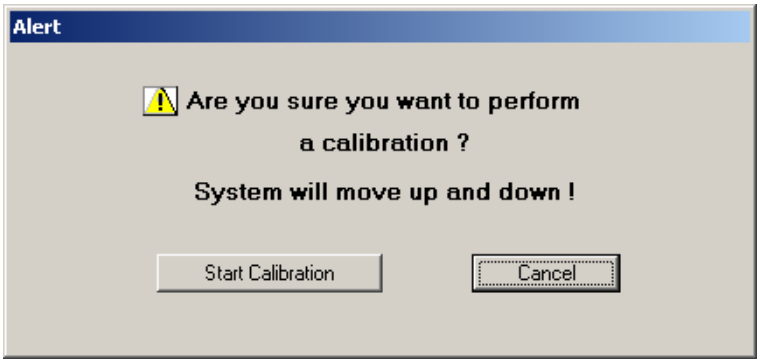
SYSTEM CALIBRATED
PRESS ESC TO MENU
PRESS OK TO GO IN SVC

Pressing OK, the system enters the in service state automatically.
Pressing ESC the main menu will be displayed.

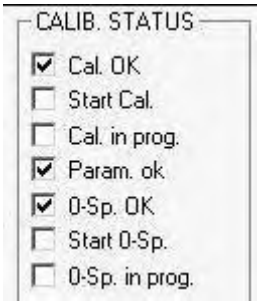
On the PC software, it is possible to start calibration selecting the “start calibration” button located in CFG tag.



A confirmation is required in order to start the calibration routine:



Calibration status is shown on the upper side on the right of the panel:



3.5 SD CARD

This NEW function is available only on PC software since the DSP release 4.01
Inserting a SD card into the slot on the display board an automatic process of data collection is activated.
Automatically will be created a folder for each month and year named DIAGyymm (yy: year mm: month). And will be stored 2 kind of files:

- **History file:** stores parameters periodically and the time between a file and the other is set in LOG TIME
- **Event file:** store parameters on event. The event that cause the storing of the file are:
  - Signal < min
  - Signal > max
  - Position error
  - Position warning
  - Probe error
  - Trips

The event file is a snapshot of 20 sec. (100 Hz sampling rate frequency) triggered on event with the pre-trigger time set by user.
It is possible to configure the storing parameters in SD CARD area in CFG tag.

The SD Card has to be formatted in FAT 16 (up to 2GB capacity).

3.6 COMMAND MODE

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
OK			**COMMAND MODE**
	ESC		To return to main menu

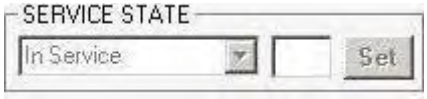
With this selection, it is possible to change the system service status.

The local control panel displays:

SERVICE OUT / IN
MANUAL

In the first line the active option is displayed in reverse.

On the PC screen, that information is shown in the SERVICE STATE window:



3.6.1 SERVICE OUT / IN

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
OK			**COMMAND MODE**
	OK		**SERVICE OUT/IN**
		ESC	To return to menu

When a different option is selected, a confirmation is required in order to change the system service status.

If the system is out of service, the OUT option is displayed in reverse and the IN selection is made pressing OK. The following message appears:

SERVICE STATE:
OUT SVC -> IN SVC
PRESS OK TO CONFIRM

The OK selection is required to confirm the option.
In order to go back to out of service state, the following confirmation message is displayed:

SERVICE STATE:
IN SVC -> OUT SVC
PRESS OK TO CONFIRM

In order to go in service state, the system must be calibrated, if this condition is not satisfied, the error message is displayed:

REFUSED REQUEST:
INVALID SYSTEM STATE!
PRESS ESC/OK TO EXIT

On the PC, it is possible to choose the service state, selecting the service status on the pull-down menu in the command mode cell.

CAUTION The plant operator has the responsibility to make sure that automatic cycling of the process valve, will not cause any damage to property or personnel before issuing the "in service" command. This includes making sure that personnel and equipment are clear of moving parts of the cylinder and process valve and that the plant process has been made safe by bypassing the process valve.

3.6.2 MANUAL

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
OK			**COMMAND MODE**
	↓		**SERVICE OUT/IN**
	OK		**MANUAL**
		ESC	To return to menu

Selecting this option, the system changes from the automatic control mode to the manual mode (Direct Mode).
To activate "Manual mode", the system must be calibrated and "out of service", in case of one or both conditions are not satisfied, the error message is displayed:

REFUSED REQUEST:
INVALID SYSTEM STATE!
PRESS ESC/OK TO EXIT

In manual mode, the required (variable value with ↑ / ↓ buttons) and current position are displayed.

OUT SVC CAL OK

REQPOS XXX.X%
ACTPOS XXX.X%

Operating with PC selecting the "Manual" option in the service pull-down menu, it's possible to insert the required position cell and confirm it, pushing the "Set" button.

SERVICE STATE
Out Of Service
Set
Out Of Service
In Service
Manual
Ack

SERVICE STATE
Manual
25
Set

3.7 FAIL & TRIP SETTING

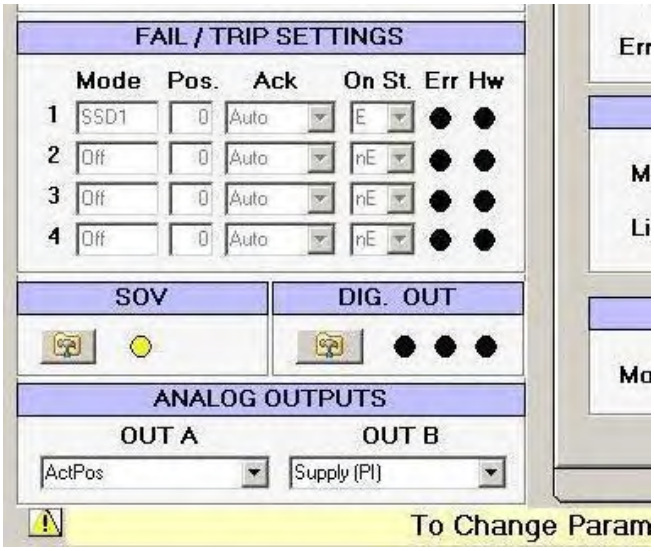
↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
OK			**FAIL & TRIP SETTING**
	ESC		To return to main menu

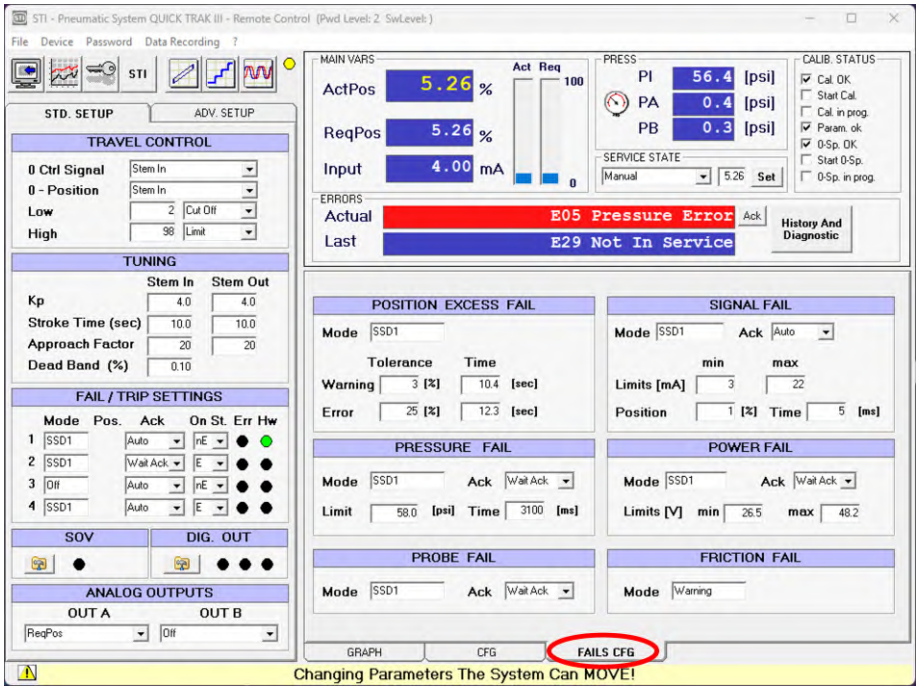
With this selection, it's possible to define the system behaviour in case of pressure, power or signal failure and/or activation of a trip signal.

This command displays the following sub menu:

SOV CONFIGURATION
POS.EXCESS FAIL MODE
POWER FAIL MODE
SIGNAL FAIL MODE
PRESSURE FAIL MODE
MODE FOR TRIP1
MODE FOR TRIP2
MODE FOR TRIP3
MODE FOR TRIP4

On the PC some of these options are displayed and can be customized in the main window, others are available in "FAILS CFG" tag.





3.7.1 SOV CONFIGURATION

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
OK			**FAIL & TRIP SETTING**
	OK		**SOV CONFIGURATION**
		ESC	To return to menu

Selecting this option, it's possible to display and modify the system configuration provided for the solenoid valves (SOV).

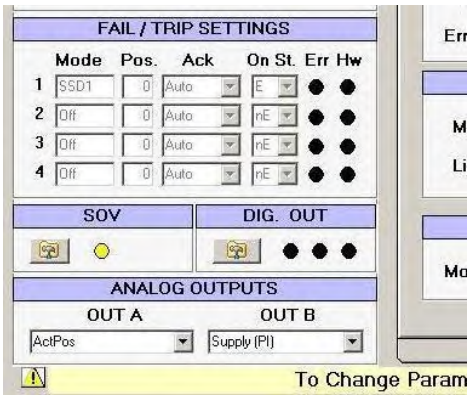
The following page is displayed:

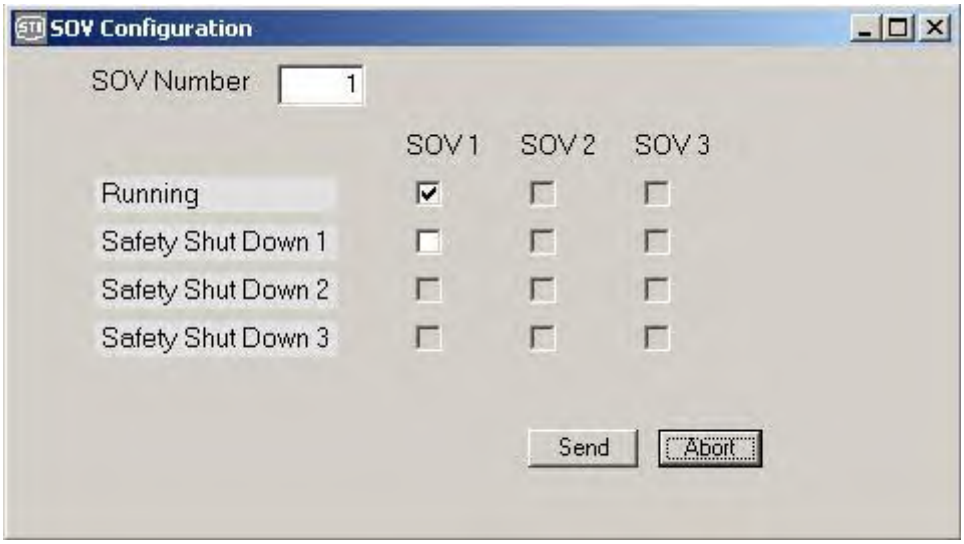
SOV N. 3 SOV1 SOV2 SOV3
RUNNING ON OFF OFF
SAFETY SD1 OFF OFF OFF
SAFETY SD2 ON OFF OFF
SAFETY SD3 OFF OFF OFF

In the first line, it's possible to configure the system SOV number (1, 2 or 3), in the second line the SOV configuration provided for running mode (normal operation mode); in next lines the SOV configuration provided for three specific cases: SAFETY SHUT DOWN 1, 2 and 3.

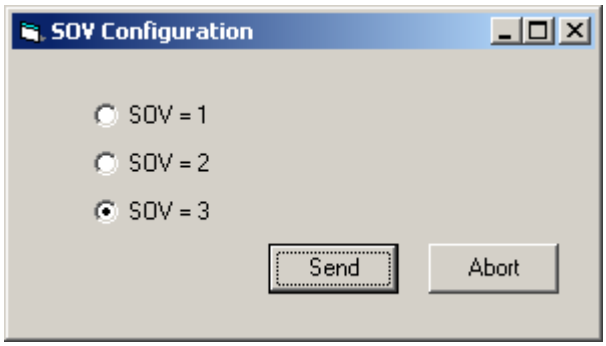
The active field will come out in reverse. With the OK selection, it's possible to change the active data field. With the ↑ / ↓ keys, it's possible to change the parameter option.

On the PC software, it's possible to display the SOV configuration, pressing the corresponding button in the "SOV Configuration" window.



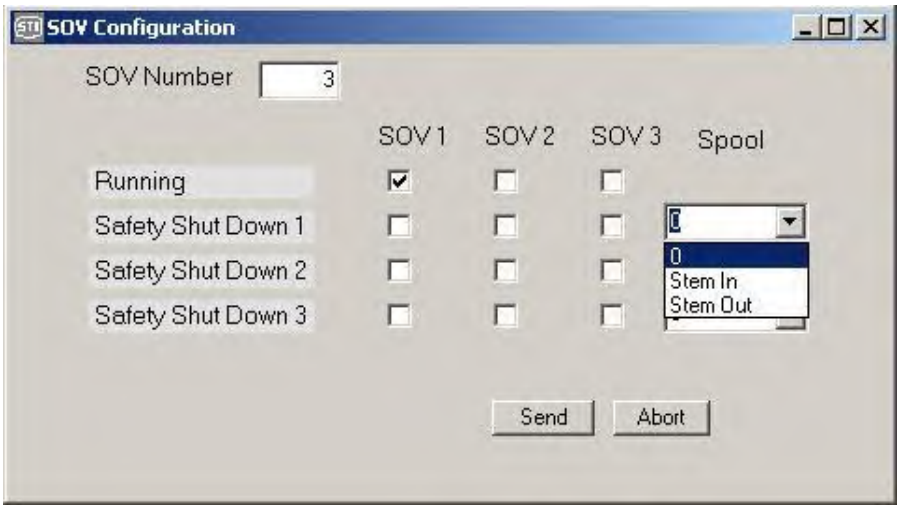


To set the SOV number, double click on the corresponding cell, and press "SEND" to confirm the value or "ABORT" to exit from this window.



To set the SOV configuration in case of running, safety shut down 1, 2, 3 modes, check the selected options and press "SEND" to confirm the entire selection or "ABORT" to exit from this window.

A new function is included starting from 4.01 firmware version. Available ONLY in PC sw enabled only with password level 2 (expert mode).



Now is possible to set the spool movement on safety shutdown (1,2 or 3) in order to improve the stroking time. This function in used only when the actuator is in a limit position (0% or 100%)

☞	**CAUTION: The function has to be configured ONLY by expert user. The spool has to move according to the pneumatic circuit.**

3.7.2 POSITION EXCESS FAIL MODE

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
OK			**FAIL & TRIP SETTING**
	↓		**SOV CONFIGURATION**
	OK		**POS.EXCESS FAIL MODE**
		ESC	To return to menu

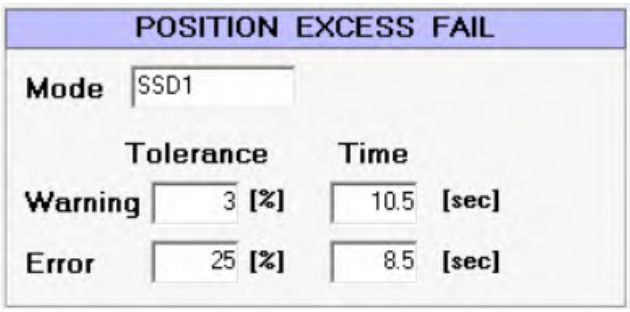
Selecting this command, it's possible to configure the max admissible position error and warning (difference between the required and the actual position) and the actions to be executed, if these limits are exceeded.

The following menu is displayed:

ERROR MODE OFF
EXCESS ERROR 25.0%
ERROR SECONDS 10.5 SEC
EXCESS WARN. 3.0%
WARN. SECONDS 8.5 SEC

On the PC, it's possible to configure all the selections and values in the "Position excess fail" panel.

NEW FUNCTION



3.7.2.1 ERROR MODE

The first line allows to configure the action to be executed in case of excess position error; the selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the "SAFETY SD1" position corresponding to the "SAFETY SD1" SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the "SAFETY SD2" position corresponding to the "SAFETY SD2" SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the "SAFETY SD3" position corresponding to the "SAFETY SD3" SOV configuration.

On the PC, it's possible to configure the position error mode.
To set the value, double click on the corresponding cell, click the option and press "Ok" to confirm it or "Cancel" to exit.

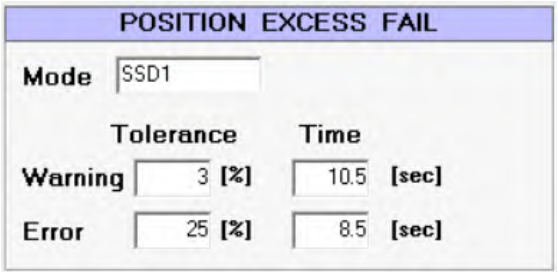
3.7.2.2 EXCESS ERROR

With this command, it's possible to set the max error position value (tolerance).

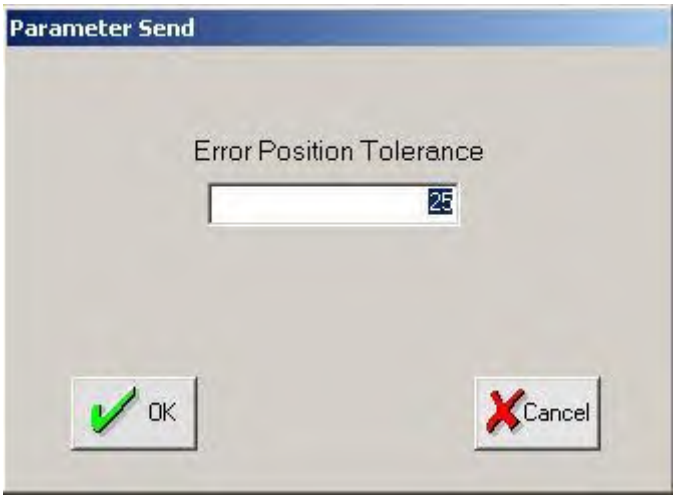
EXCESS ERROR
3.0 %
PRESS OK TO CONFIRM

The value can be changed by pressing the ↑ and ↓ keys in a range between 0÷100% and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC, it's possible to configure the parameter in the "Position excess fail" panel.



To set the value, double click on the corresponding cell, input the value and press “Ok” to confirm it or “Cancel” to exit.



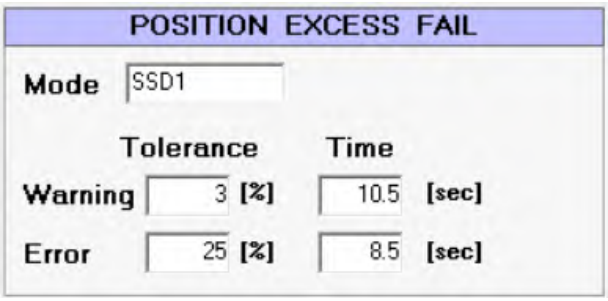
3.7.2.3 ERROR SECONDS

In case of error condition, this parameter defines the waiting time before the alarm is activated.

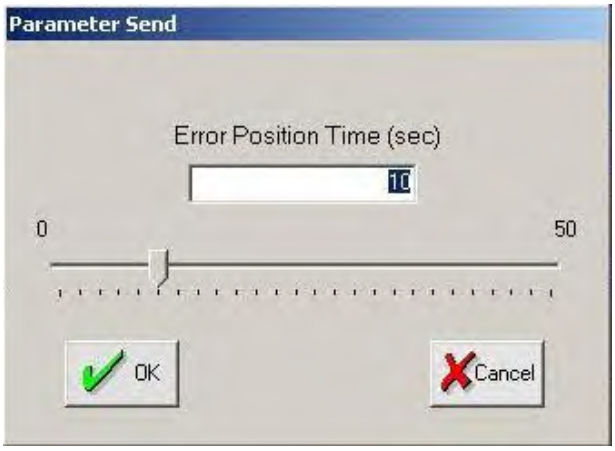
ERROR SECONDS
8.5 SEC
PRESS OK TO CONFIRM

The value can be changed by pressing the ↑ and ↓ keys in a range between 0÷5000 seconds and subsequently confirmed with OK. Press ESC to return to the previous menu.

From the PC, it’s possible to configure the parameter in the “Position excess fail” panel located in “FAILS CFG” tag.



To set the value, double click on the corresponding cell, input the value and press “Ok” to confirm it or “Cancel” to exit.



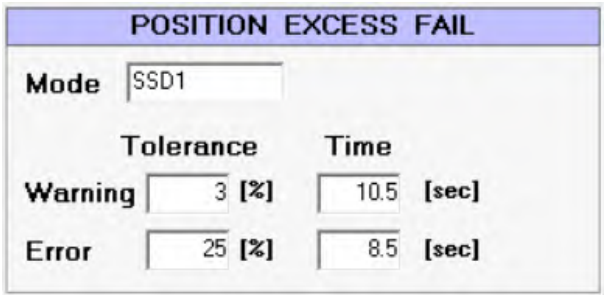
3.7.2.4 EXCESS WARNING

The selection allows to set the max warning position value (tolerance) in the 0÷100% range.

EXCESS WARN.
3.0 %
PRESS OK TO CONFIRM

The value can be changed by pressing the ↑ and ↓ keys and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC, it's possible to configure the parameter in the "Position excess fail" panel.



To set the value, double click on the corresponding cell, input the value and press "OK" to confirm it or "Cancel" to exit.

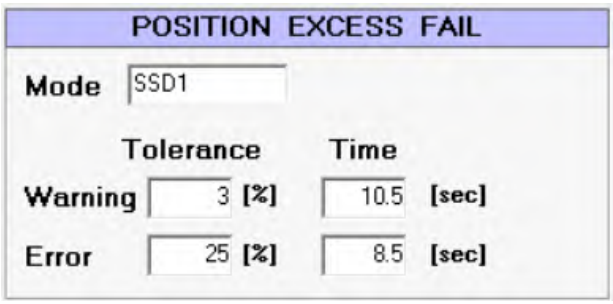
3.7.2.5 WARNING SECONDS

In case of warning condition this value is the waiting time before the alarm is activated. It's possible to insert a value in the range of 0÷1000 seconds.

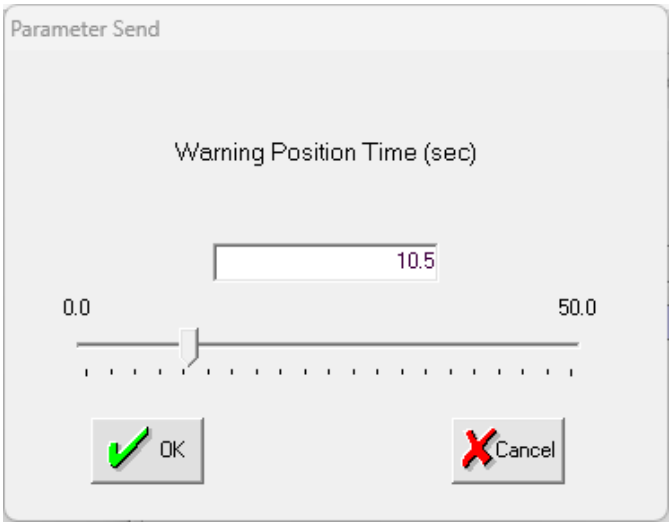
WARN. SECONDS
10.5 SEC
PRESS OK TO CONFIRM

The value can be changed by pressing the ↑ and ↓ keys and confirmed with OK. Press ESC to return to the previous menu.

On the PC, it's possible to configure the parameter in the "Position excess fail" panel.



To set the value, double click on the corresponding cell, input the value and press "OK" to confirm it or "Cancel" to exit.



3.7.3 POWER FAIL MODE

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
OK			FAIL & TRIP SETTING
	↓		SOV CONFIGURATION
	↓		POS.EXCESS FAIL MODE
	OK		POWER FAIL MODE
		ESC	To return to menu

Selection of this command, allows to define the minimum and maximum admissible power to the main PCB, and to configure the power fail condition.

The displayed menu is:

ERROR MODE OFF
END MODE AUTO
POWER LIMIT

On the PC, is possible to configure all the selections and values in the “Power fail” panel.

3.7.3.1 ERROR MODE

The first line allows to configure the action to be executed in case of low voltage supply power. The selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the “SAFETY SD1” position corresponding to the “SAFETY SD1” SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the “SAFETY SD2” position corresponding to the “SAFETY SD2” SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the “SAFETY SD3” position corresponding to the “SAFETY SD3” SOV configuration.
WARNING	All cases	On the positioner display will be shown a warning message

On the PC, it’s possible to configure the power error mode.
To set the value, double click on the corresponding cell, click the option and press “SEND” to confirm it or “ABORT” to exit.

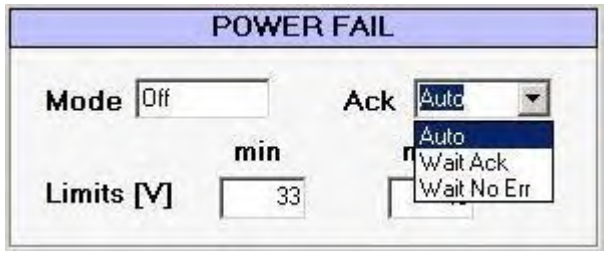
Error Mode
Off
Safety Shut Down 1
Safety Shut Down 2
Safety Shut Down 3
Spool
Freeze
Ack
External SOV
Warning
Abort
Send

3.7.3.2 END MODE

The end mode option allows to configure the action to be executed at the end of the error conditions, the selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	EXECUTED ACTION
AUTO	Automatic return to normal working condition without waiting for confirmation.
WAIT ACK	A confirmation is required before returning to normal working condition.
WAIT NOERR	Automatic return to normal working condition only if all error conditions have been cleared.

On the PC, it is possible to choose the power fail end mode, selecting the option on the corresponding pull-down menu.



3.7.3.3 POWER LIMIT

A list with high and low power limit values is displayed:

POW.LIMIT LOW 33.0V
POW.LIMIT HIGH 45.0V

Selecting the first line, it is possible to modify the low voltage supply limit value.

POW. LIMIT LOW
33.0 V
PRESS OK TO CONFIRM

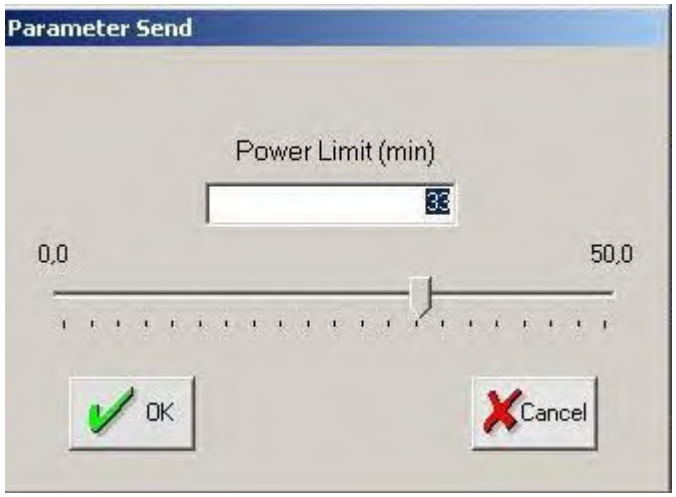
The admissible range is between 0 to 50 Vdc.
The value can be changed by pressing the ↑ and ↓ keys and subsequently confirmed with OK. Press ESC to return to the previous menu.

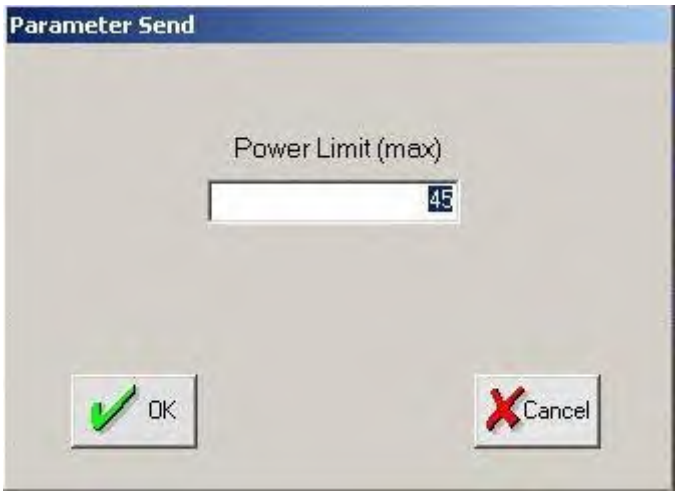
Selecting the second line, it is possible to modify the high voltage supply limit value.

POW. LIMIT HIGH
45.0 V
PRESS OK TO CONFIRM

The admissible range is between 30 to 100 Vdc.
The value can be changed by pressing the ↑ and ↓ keys and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC, it is possible to modify the low and high power limits.
To set the parameters, double click on the selected cell, input the value and press “OK” to confirm it or “Cancel” to exit from the input window.


Parameter Send
Power Limit (min)
33
0,0
50,0
OK
Cancel


Parameter Send
Power Limit (max)
45
OK
Cancel

3.7.4 SIGNAL FAIL MODE

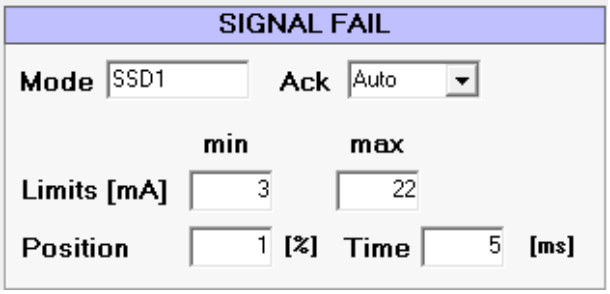
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
OK			FAIL & TRIP SETTING
	↓		SOV CONFIGURATION
	↓		POS.EXCESS FAIL MODE
	↓		POWER FAIL MODE
	OK		SIGNAL FAIL MODE
		ESC	To return to menu

This command allows to configure the minimum and maximum admissible inlet signal (mA), the actions to be executed if these limits are reached and the error clearing condition.

Selecting the option the following menu is displayed:

ERROR MODE OFF
END MODE AUTO
SIGNAL LIMIT
ACTUATOR POSITION

On the PC, it's possible to configure all the selections and values in the "Signal fail" panel located in "FAILS CFG" tag.



3.7.4.1 ERROR MODE

The first line allows to configure the action to be executed in case of an out of range or fail signal. The selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options and relevant actions are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the “SAFETY SD1” position corresponding to the “SAFETY SD1” SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the “SAFETY SD2” position corresponding to the “SAFETY SD2” SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the “SAFETY SD3” position corresponding to the “SAFETY SD3” SOV configuration.
SPOOL	All cases	The actuator is driven to a specific position using the spool (see actuator position).
FREEZE	All cases	Actuator freezes in last position.
WARNING	All cases	On the positioner display will be shown a warning message

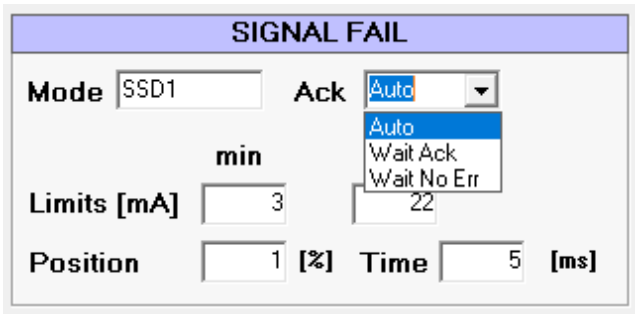
On the PC, it’s possible to configure the signal error mode.
To set the value, double click on the corresponding cell, click the option and press “Send” to confirm it or “Abort” to exit.

3.7.4.2 END MODE

The end mode option configures the action to be executed at the end of the error conditions. The selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	EXECUTED ACTION
AUTO	Automatic return to normal working condition without waiting for confirmation.
WAIT ACK	A confirmation is required before returning to normal working condition.
WAIT NOERR	Automatic return to normal working condition only if all error conditions have been cleared.

On the PC, it is possible to choose the power end mode selecting the option on the corresponding pull-down menu.



3.7.4.3 SIGNAL LIMIT

A list with high and low signal limit values is displayed:

SIGN.LIMIT LOW 3.0
SIGN.LIMIT HIGH 22.0

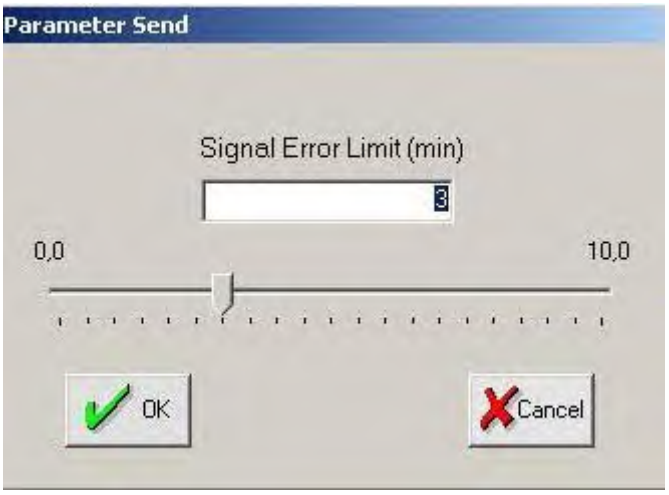
Selecting the first line, it is possible to modify the low limit, using the □ and □ keys and the OK button to confirm.

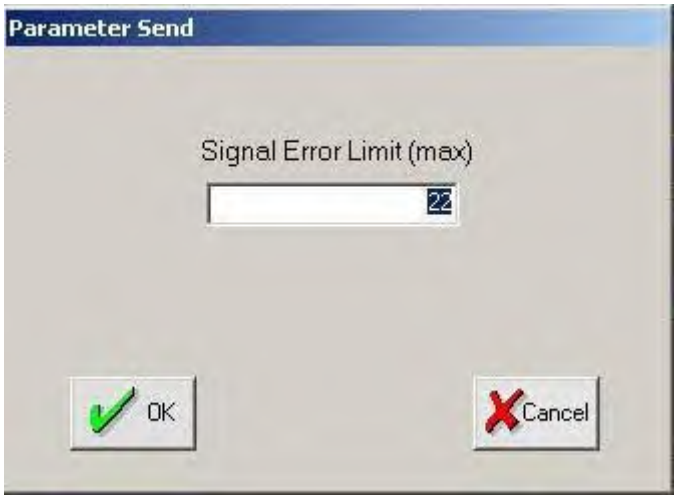
SIGN. LIMIT LOW
3.0
PRESS OK TO CONFIRM

For upper signal limit, the displayed message is:

SIGN. LIMIT HIGH
22.0
PRESS OK TO CONFIRM

On the PC, it is possible to configure all the values in the “Signal fail” panel.
To set the value, double click on the selected cell, input the value and press “OK” to confirm it or “Cancel” to exit from the input window.





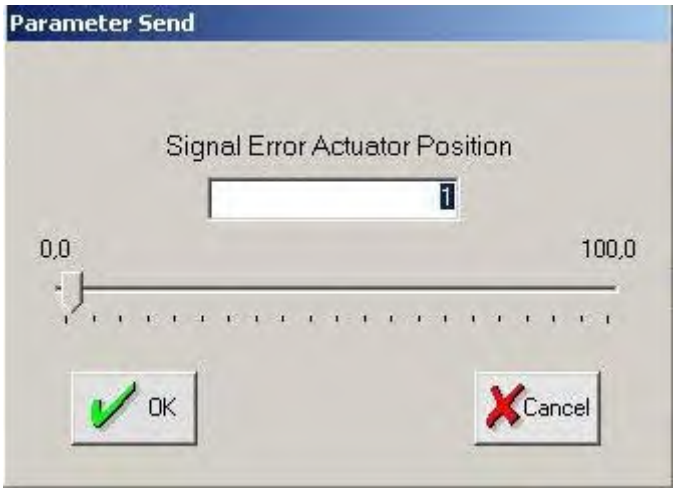
3.7.4.4 ACTUATOR POSITION

This function is active only if the “Spool” selection has been made for the “Error mode” option; by this function it’s possible to define the actuator position in case of signal fail.

ACTUATOR POSITION
1.0 %
PRESS OK TO CONFIRM

The value of the position (expressed in percentage of the stroke) can be adjusted between -10 and 110% of the stroke, by pressing the ↑ and ↓ keys and subsequently confirmed with the OK key.

To set the value, on the PC, double click on the corresponding cell, input the value and press “OK” to confirm it or “Cancel” to exit from the input window.



3.7.5 PRESSURE FAIL MODE

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
OK			FAIL & TRIP SETTING
	↓		SOV CONFIGURATION
	↓		POS.EXCESS FAIL MODE
	↓		POWER FAIL MODE
	↓		SIGNAL FAIL MODE
	OK		PRESSURE FAIL MODE
		ESC	To return to menu

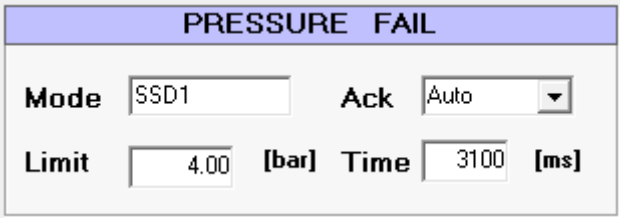
This command allows to configure the minimum admissible supply pressure value.

The following menu is displayed:

ERROR MODE OFF
END MODE AUTO
PRESS. LIMIT 4.0 Bar
TIME 3100 ms

On the PC, it is possible to configure all the selections and values in the “Pressure fail” panel located in “FAILS CFG” tag.

NEW FUNCTION



3.7.5.1 ERROR MODE

The first line allows to configure the action to be executed in case of supply pressure error. The selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the “SAFETY SD1” position corresponding to the “SAFETY SD1” SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the “SAFETY SD2” position corresponding to the “SAFETY SD2” SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the “SAFETY SD3” position corresponding to the “SAFETY SD3” SOV configuration.
WARNING	All cases	On the positioner display will be shown a warning message

On the PC, it’s possible to configure the pressure error mode.
To set the value, double click on the corresponding cell, click the option and press “SEND” to confirm it or “ABORT” to exit.

3.7.5.2 END MODE

The end mode option allows to configure the action to be executed at the end of the error conditions. The selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	EXECUTED ACTION
AUTO	Automatic return to normal working condition without waiting for confirmation.
WAIT ACK	A confirmation is required before returning to normal working condition.
WAIT NOERR	Automatic return to normal working condition only if all error conditions have been cleared.

On the PC, it is possible to choose the pressure end mode selecting the option on the corresponding pull-down menu.

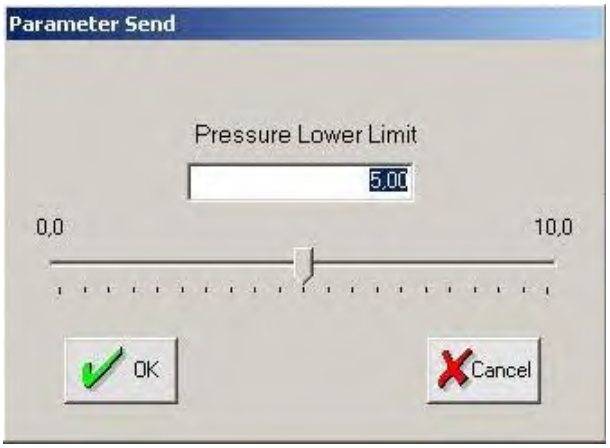
3.7.5.3 PRESSURE LIMIT

This option allows to set the minimum admissible supply pressure value (Psi or bar).

PRESS. LIMIT
5.00 Bar
PRESS OK TO CONFIRM

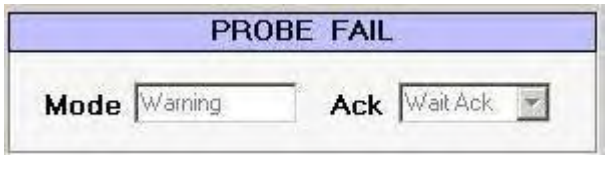
NEW FUNCTION

The input pressure value can be selected in a range of 0÷150 Psi or 0÷10 bar, using the □ and □ keys. OK button confirmation is required.
On the PC, it is possible to modify the pressure limit, and the time delay configurable in a range of 250÷5000 ms.
There is a fixed hysteresis (250 mbar) at the low-pressure threshold for the error to disappear.
To set the value, double click on the selected cell, input the value and press “OK” to confirm it or “Cancel” to exit from the input window.



3.7.6 PROBE FAIL

Starting from DSP release 4.01 is available ONLY on PC software the Probe fail error configuration.
To configure this error refer to Probe Fail window located in “FAILS CFG” tag.



3.7.6.1 PROBE FAIL ERROR MODE

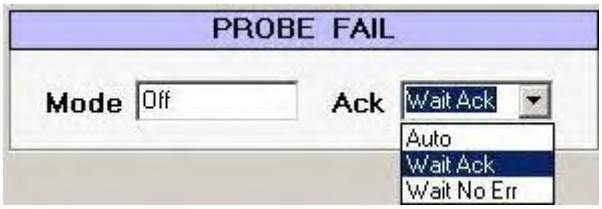
On PC software is possible to configure the error mode double clicking on Probe Fail area and select the related function. The available options are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the “SAFETY SD1” position corresponding to the “SAFETY SD1” SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the “SAFETY SD2” position corresponding to the “SAFETY SD2” SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the “SAFETY SD3” position corresponding to the “SAFETY SD3” SOV configuration.
WARNING	All cases	On the positioner display will be shown a warning message

3.7.6.2 PROBE FAIL END MODE

The end mode option allows to configure the action to be executed at the end of the error conditions.. The available options are:

OPTION	EXECUTED ACTION
AUTO	Automatic return to normal working condition without waiting for confirmation.
WAIT ACK	A confirmation is required before returning to normal working condition.
WAIT NOERR	Automatic return to normal working condition only if all error conditions have been cleared.



3.7.7 TRIPS MODE (for trip 1, 2, 3, 4)

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
OK			FAIL & TRIP SETTING
	↓		SOV CONFIGURATION
	↓		POS.EXCESS FAIL MODE
	↓		POWER FAIL MODE
	↓		SIGNAL FAIL MODE
	↓		PRESSURE FAIL MODE
	OK		MODE FOR TRIP1-4
		ESC	To return to menu

This option allows to configure the position of the actuator when the trip 1 (or 2, 3, 4) is fired, the actions to be executed and the trip clearing condition.

With the selection of one of the available trips, the displayed menu is:

ERROR MODE OFF
END MODE AUTO
ACTUATOR POSITION
ON STATUS NOT ENERG.

On the PC, all these options could be configured from the “Trips” panel located in main window.

3.7.7.1 ERROR MODE

The first line allows to configure the action to be executed in case of trip signal, the selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the “SAFETY SD1” position corresponding to the “SAFETY SD1” SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the “SAFETY SD2” position corresponding to the “SAFETY SD2” SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the “SAFETY SD3” position corresponding to the “SAFETY SD3” SOV configuration.
SPOOL	All cases	The actuator is driven to a specific position using the spool (see actuator position).
FREEZE	All cases	Actuator freezes in last position.
ACK	All cases	Trip is used for the error acknowledgment in remote mode.
EXTERNAL SOV	All cases	External safety shut down valve has been activated.
WARNING	All cases	On the positioner display will be shown a warning message

On the PC, it’s possible to configure the signal error mode.
To set the value, double click on the corresponding cell, click the option and press “SEND” to confirm it or “ABORT” to exit.

3.7.7.2 END MODE

The end mode option allows to configure the action to be executed at the end of the error conditions, the selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	EXECUTED ACTION
AUTO	Automatic return to normal working condition without waiting for confirmation.
WAIT ACK	A confirmation is required before returning to normal working condition.
WAIT NOERR	Automatic return to normal working condition only if all error conditions have been cleared.

On the PC, it is possible to choose the trip end mode, selecting the option on the corresponding pull-down menu.

3.7.7.3 ACTUATOR POSITION

This function is active only if the “Spool” selection has been made for the “Error mode” option; it allows to define the position of the actuator in case of trip.

ACTUATOR POSITION
1.0 %
PRESS OK TO CONFIRM

The value of the position (expressed in percentage of the stroke) can be adjusted between -10 and 110% of the stroke, by pressing the ↑ and ↓keys and subsequently confirmed with the OK key.

To set the value, on the PC, double click on the corresponding cell, input the value and press “OK” to confirm it or “Cancel” to exit from the input window.

3.7.7.4 ON STATUS

This option allows to configure the ON status for the selected trip; the changing can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION		DESCRIPTION
E	= ENERGIZED	ON Status = Energized. Corresponds to “1” state.
nE	= NOT ENERG.	ON Status = NOT Energized. Corresponds to “0” state.

On the PC, it is possible to choose the trip ON status, selecting the option on the corresponding pull-down menu.

3.8 GENERAL SETTING

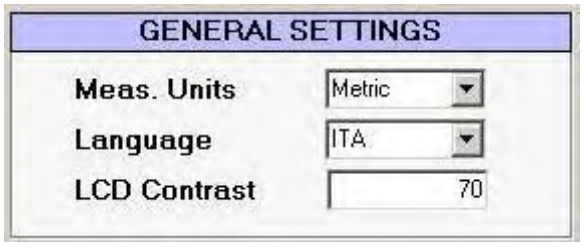
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	ESC		To return to main menu

This menu allows to customize the system.

The displayed menu is:

MEASUR UNITS MET/IMP
LANGUAGE ENGLISH
DATE & TIME
PASSWORD
CONTRAST

On the PC, only some of these data are available into the “General setting” panel located in CFG tag.



The password login and changing are available in the main command line (pull-down password menu).

3.8.1 MEASUREMENTS UNITS

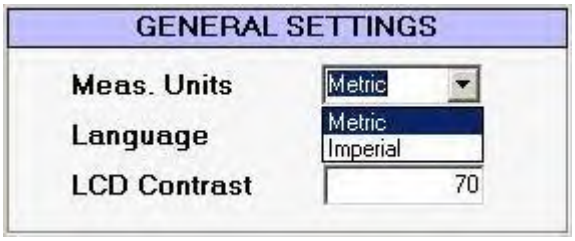
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	OK		MEASUR UNITS
		ESC	To return to menu

This command allows to configure the measurement units system used to display the variables.

The configuration can be made by selecting the line with the up / down buttons, scrolling the options by pushing the OK key and choosing between ISO metrical system (MET) and imperial system (IMP).

VARIABLE	ISO Metrical system	Imperial system
Pressure	bar	Psi
Temperature	°C	°F

On the PC, it is possible to choose the measurement units system, selecting the option on the corresponding pull-down menu.



3.8.2 LANGUAGE

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	↓		MEASUR UNITS
	OK		LANGUAGE
		ESC	To return to menu

The available option for the language is English.

3.8.3 DATE AND TIME

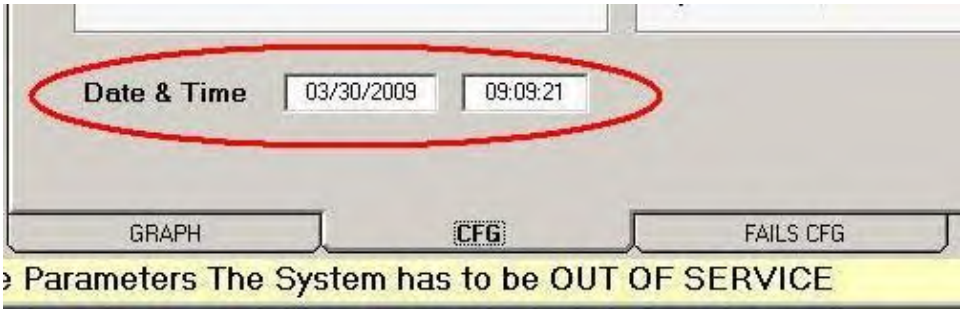
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	↓		MEASUR UNITS
	↓		LANGUAGE
	OK		DATE & TIME
		ESC	To return to menu

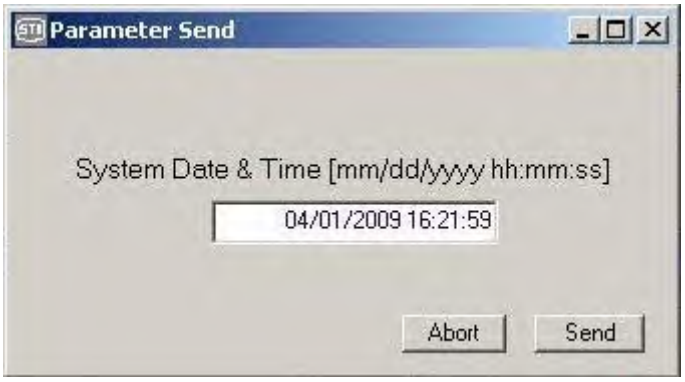
This option allows to configure the system date and time.

[mm/dd/yyyy]
10 / 03 / 2007
12: 25: 41

Every value can be modified using the up / down buttons and the OK key to confirm it.

On the PC, it is possible to modify the system date and time.
To set the value, double click on the corresponding cells located in CFG tag, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.





3.8.4 PASSWORD

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
OK			**GENERAL SETTING**
	↓		**MEASUR UNITS**
	↓		**LANGUAGE**
	↓		**DATE & TIME**
	OK		**PASSWORD**
		ESC	To return to menu

With this selection, it's possible to change the user password.

The following menu is displayed:

PASSWORD: _ _ _ _ _
CONFIRM: _ _ _ _ _

A sequence of 5 push buttons is required to define the user password, used to enter the system from the local panel (the device is supplied by the manufacturer with the default user password [OK ↑ ↓ ↑ ↓]).
On the PC, a sequence of alfa-numerical digits is required (default is 12345).

3.8.5 CONTRAST

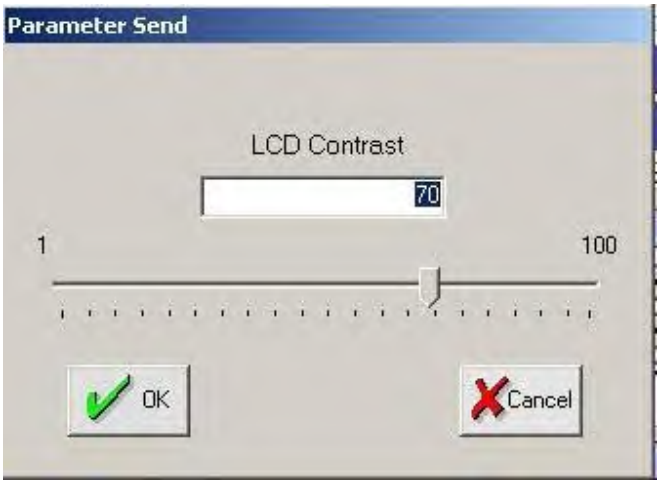
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	↓		MEASUR UNITS
	↓		LANGUAGE
	↓		DATE & TIME
	↓		PASSWORD
	OK		CONTRAST
		ESC	To return to menu

Selecting this option, it's possible to adjust the contrast of the local control device monitor.

CONTRAST
070

The value can be changed in a range between 1 and 100 using the up / down buttons and can be confirmed by the OK key.

On the PC, it is possible to adjust the contrast from the "General setting" panel.



To set the value, double click on the corresponding cell, input the value and press "OK" to confirm it or "Cancel" to exit from the input window.

3.9 SYSTEM DATA

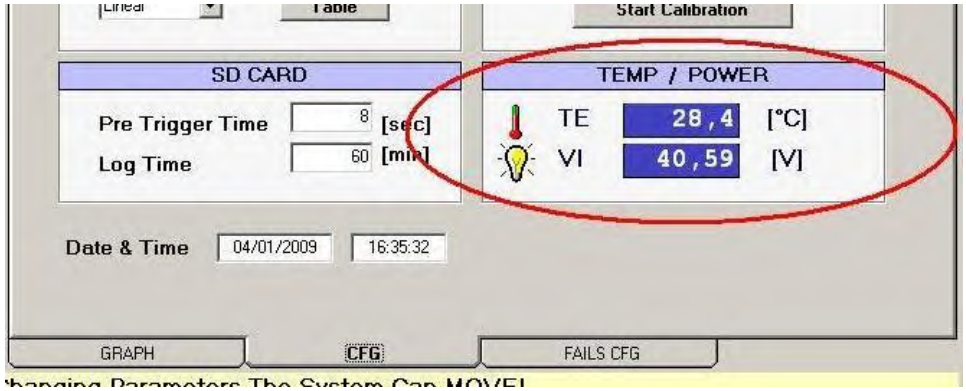
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
OK			SYSTEM DATA
	ESC		To return to main menu

This option shows on the local control panel display the values of the electronic board temperature (TE) and the supply power voltage (VI) on the main PCB.

SYSTEM DATA

TE XXX.X C
VI X:XX V

On the PC, these values are displayed in “CFG” tag



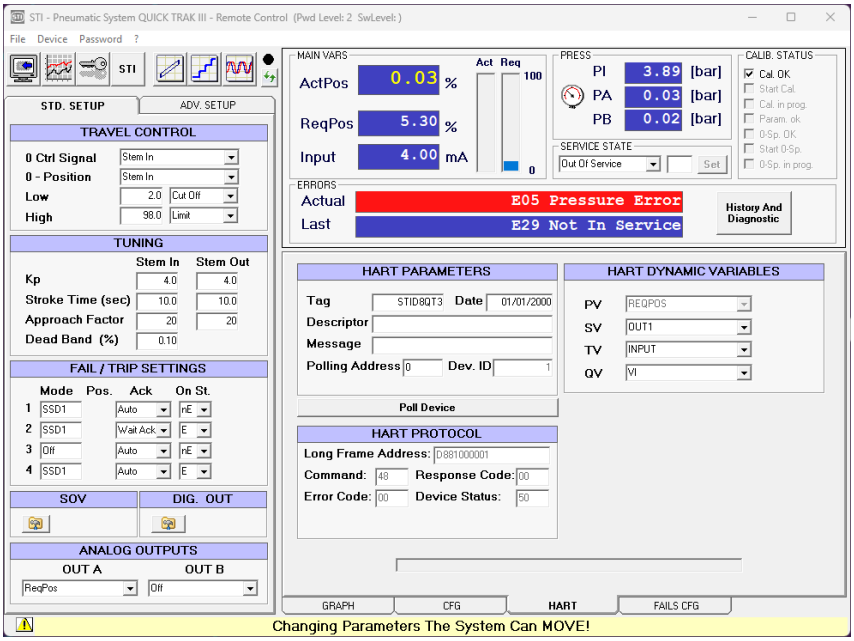
3.10 COMMUNICATION

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
OK			COMMUNICATION
	ESC		To return to main menu

Selecting the only (at the present time) available option in the menu COMMUNICATION, it's possible to enter the HART PROTOCOL 6.0 parameters list.

HART TAG
MESSAGE
DESCRIPTOR
DATE
POLLING ADDRESS 0
DEVICE ID 1

On the PC, these data are available into the "Hart " tag. Note that this tag in displayed only when the software is connected in HART mode



3.10.1 HART TAG

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
OK			COMMUNICATION
	OK		HART TAG
		ESC	To return to menu

This option allows to display the HART parameter named Tag.

HART TAG
STID881
PRESS ESC/OK TO EXIT

The Tag is a 8 character label assigned by the end user based on the location and use of the field device. It's a 8 character (6 byte) Packed ASCII string used to identify the field device. The term originated when physical tags were attached to instruments for this purpose.
It's not possible to modify the Tag parameter by the local user interface.

This operation is possible on the PC, from the "Communication" panel.

To set the value, double click on the corresponding cell, input the value and press "SEND" to confirm it or "ABORT" to exit from the input window.

3.10.2 MESSAGE

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
OK			**COMMUNICATION**
	↓		**HART TAG**
	OK		**MESSAGE**
		ESC	To return to menu

This option allows to display the HART parameter named Message.

MESSAGE
…first 16 chars
…second 16 chars
PRESS ESC/OK TO EXIT

The Message is a 32 character (24 byte) Packed ASCII string used by the Master for record keeping.
The default value is a blanked string, 32 bytes long.
It's not possible to modify the Message parameter by the local user interface.

This operation is possible on the PC, from the "Communication" panel.

To set the value, double click on the corresponding cell, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.

3.10.3 DESCRIPTOR

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
OK			**COMMUNICATION**
	↓		**HART TAG**
	↓		**MESSAGE**
	OK		**DESCRIPTOR**
		ESC	To return to menu

This option allows to display the HART parameter named Descriptor.

DESCRIPTOR
…….16 chars
PRESS ESC/OK TO EXIT

The Descriptor is a 16 character (12 byte) Packed ASCII string used by the Master for record keeping.
The default value is a blanked string, 16 bytes long.
It’s not possible to modify the Descriptor parameter by the local user interface.

This operation is possible on the PC, from the “Communication” panel.

To set the value, double click on the corresponding cell, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.

3.10.4 DATE

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
OK			COMMUNICATION
	↓		HART TAG
	↓		MESSAGE
	↓		DESCRIPTOR
	OK		DATE
		ESC	To return to menu

This option allows to display and/or modify the HART parameter named Date.

DATE [mm/dd/yyyy]
05/29/2006
PRESS ESC TO EXIT

The date is represented by three 8-bit binary unsigned integers representing, respectively, the day, month and year (minus 1900). It's a date code, used by the Master for record keeping (e.g. last or next calibration date).
In this page, the 4 provided keys are OK, ↑, ↓ and ESC and they have the following function:
OK key allows to shift from a field to another one of the page or in clockwise direction from day to month and to year.
Key ↑ once pointed out the interest field, the current value is allowed to increase according to the field standards (ex.: day field including between 1 and 31);
Key ↓ once pointed out the concern field, the current value is allowed to decrease according to the field standards (ex.: month field including between 1 and 12);
The ESC key allows to return to the Hart Protocol submenu.

On the PC, it is possible to modify the Date parameter from the "Communication" panel.

To set the value, double click on the corresponding cell, input the value and press "SEND" to confirm it or "ABORT" to exit from the input window.

3.10.5 POLLING ADDRESS

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
OK			COMMUNICATION
	↓		HART TAG
	↓		MESSAGE
	↓		DESCRIPTOR
	↓		DATE

	OK		**POLLING ADDRESS**
		ESC	To return to menu

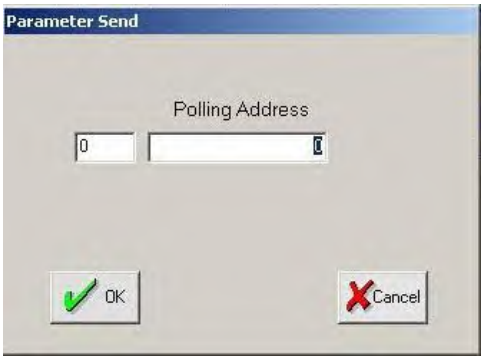
This option allows to display and/or modify the HART parameter named Polling Address.

POLLING ADDRESS
00
PRESS OK TO CONFIRM

In the HART Protocol, the polling address is an integer used to identify the field device. It is used to construct the Short Frame Address. The Polling Address is set to 0 in point to point installations.

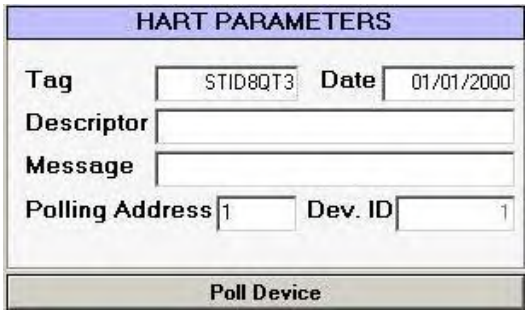
The 4 keys provided in this page have the following function:
Key ↑ allows to increase the current value of polling address within a foreseen range from 0 and 15;
Key ↓ allows to decrease the current value of polling address, within a foreseen range from 0 and 15;
OK key confirms the defined polling address and allows to return to the submenu Hart Protocol.
ESC key cancels any current modification phase and allows to return to the Hart Protocol submenu.

On the PC, it is possible to modify the Polling Address from the “Communication” panel.



To set the value, double click on the corresponding cell, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.

The master usually reaches the devices, starting from polling address equal to 0.
In multi-drop installations all the field devices are generally configured to a different polling address to allow automatic identification by the master.
Using the “Poll” command button, it’s possible to identify a device having the polling address not equal to 0.



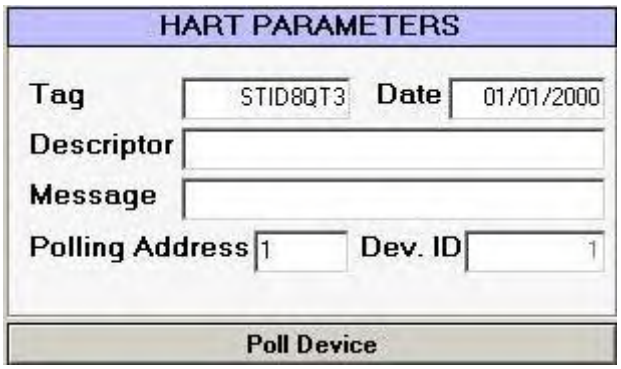
3.10.6 DEVICE ID

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
OK			COMMUNICATION
	↓		HART TAG
	↓		MESSAGE
	↓		DESCRIPTOR
	↓		DATE
	↓		POLLING ADDRESS
	OK		DEVICE ID
		ESC	To return to menu

This option allows to display the HART parameter named Device ID (integer number).

This number is different for every device manufactured with a given Manufacturer ID and Device Type. It returned in bytes 9-11 of Identity Commands and for the QuickTrak III it coincides with the system serial number (Part Number).

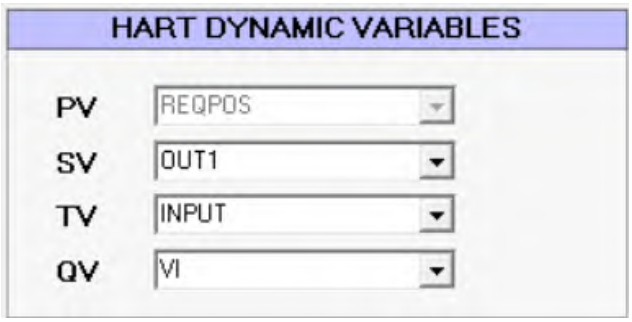
It's not possible to modify the Device ID parameter by the local user interface or by remote; this value changes if the Part Number parameter is modified. See chapter ADVANCED for details.



3.10.7 HART DYNAMIC VARIABLES

This menu is used to change the device HART dynamic variables assignments for the Secondary Variable (SV), the Tertiary Variable (TV) and the Quaternary Variable (QV). The Primary Variable (PV) is fixed and always linked to REQPOS.

NEW FUNCTION



3.11 DIAGNOSTIC

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
OK			**DIAGNOSTIC**
	ESC		To return to main menu

This option allows to display the system diagnostic information.

The following sub menu is displayed:

STROKE KM XXXXXX.XX
IN SVC HOURS XXXXXX.XX
MIN TEMP. XXX.XC
MAX TEMP. XXX.XC
AVER.TEMP. XXX.XC
PERM. TIME
dP UP-DOWN
ERROR STAT
CALIB STAT
OUT SVC STAT
IN SVC STAT
STAT FREQ

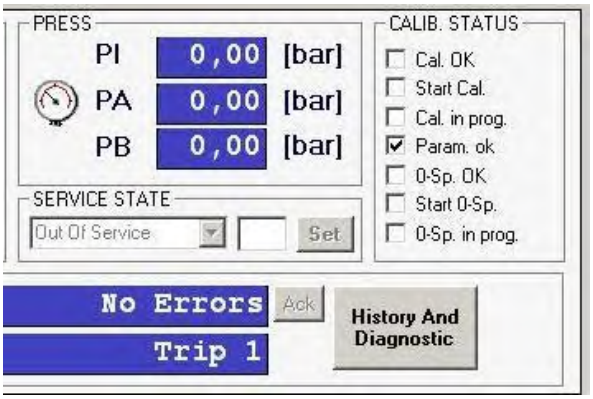
with some data directly available:

STROKE KM XXXXXX.XX
IN SVC HOURS XXXXXX.XX
MIN TEMP. XXX.XC
MAX TEMP. XXX.XC
AVER.TEMP. XXX.XC

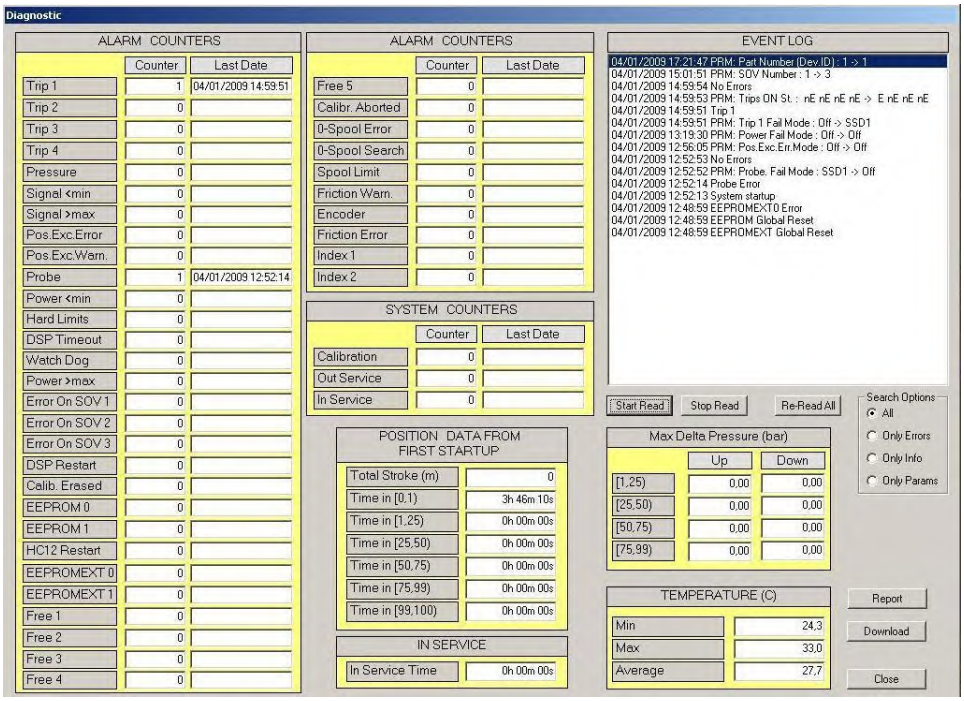
where:

- STROKE KM is the total distance covered by the stem (piston) expressed in [km]
- IN SVC HOURS the total time of working [h]
- MIN TEMP. is the minimum temperature reached during the use
- MAX TEMP. is the maximum temperature reached during the use
- AVER.TEMP is the average temperature during the use

On the PC, pushing the “History And Diagnostic” button located in main page:



It's possible to display the system diagnostic data page:



From this page, press the "Download" command button to read or refresh the system diagnostic data. Press the "Report" command button to save the data in RTF format.

Starting from Release 4.01 the event log function is implemented. Is possible to configure the event that have to be displayed and using the buttons under the EVENT LOG window is possible to start or stop the reading. Event log data are included in report file.

Diagnostic Report

```
Report Date: 01/04/2009 17.43

Alarm          Counter       Date
Trip 1    :        1    04/01/2009 14:59:51
Trip 2    :        0
Trip 3    :        0
```

```
Trip 4     :      0
Pressure    :      0
Signal <min :      0
Signal >max :      0
Pos.Exc.Error:      0
Pos.Exc.Warn.:      0
Probe     :     1   04/01/2009 12:52:14
Power <min  :      0
Hard Limits :      0
DSP Timeout :      0
Watch Dog   :      0
Power >max  :      0
Error On SOV 1:      0
Error On SOV 2:      0
Error On SOV 3:      0
DSP Restart :      0
Calib. Erased:      0
EEPROM 0    :      0
EEPROM 1    :      0
HC12 Restart :      0
EEPROMEXT 0 :      0
EEPROMEXT 1 :      0
Free 1      :      0
Free 2      :      0
Free 3      :      0
Free 4      :      0
Free 5      :      0
Calibr. Aborted:      0
0-Spool Error:      0
0-Spool Search:      0
Spool Limit :      0
Friction Warn.:      0
Encoder     :      0
Friction Error:      0
Index 1     :      0
Index 2     :      0

System        Counter       Date
Calibration :      0
Out Service :      0
In Service  :      0

TEMPERATURE (C)
Min  : 24.3
Max  : 33.0
Average: 27.7

In Service Time: 0h 00m 00s
Total Stroke (m): 0

Time in [0,1) : 3h 46m 10s
Time in [1,25) : 0h 00m 00s
```

```
Time in [25,50): 0h 00m 00s
Time in [50,75): 0h 00m 00s
Time in [75,99): 0h 00m 00s
Time in [99,100): 0h 00m 00s

Max Delta Pressure (bar)
[1,25)  Up: 0.00     Down: 0.00
[25,50) Up: 0.00     Down: 0.00
[50,75) Up: 0.00     Down: 0.00
[75,99) Up: 0.00     Down: 0.00

Events Log
04/01/2009 17:21:47 PRM: Part Number (Dev.ID): 1 -> 1
04/01/2009 15:01:51 PRM: SOV Number: 1 -> 3
04/01/2009 14:59:54 No Errors
04/01/2009 14:59:53 PRM: Trips ON St.: nE nE nE nE ->
E nE nE nE
04/01/2009 14:59:51 Trip 1
04/01/2009 14:59:51 PRM: Trip 1 Fail Mode: Off -> SSD1
04/01/2009 13:19:30 PRM: Power Fail Mode: Off -> Off
04/01/2009 12:56:05 PRM: Pos.Exc.Err.Mode: Off -> Off
04/01/2009 12:52:53 No Errors
04/01/2009 12:52:52 PRM: Probe. Fail Mode: SSD1 -> Off
04/01/2009 12:52:14 Probe Error
04/01/2009 12:52:13 System startup
04/01/2009 12:48:59 EEPROMEXT0 Error
04/01/2009 12:48:59 EEPROM Global Reset
04/01/2009 12:48:59 EEPROMEXT Global Reset
```

3.11.1 PERM. TIME

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
OK			**DIAGNOSTIC**
	↓		**STROKE KM**
	↓		**IN SVC HOURS**
	↓		**MIN TEMP.**
	↓		**MAX TEMP.**
	↓		**AVER.TEMP.**
	OK		**PERM. TIME**
		ESC	To return to menu

With this selection, it is possible to know the permanence time in defined range of the stroke. The stroke range expressed in percent of the stroke are the following:

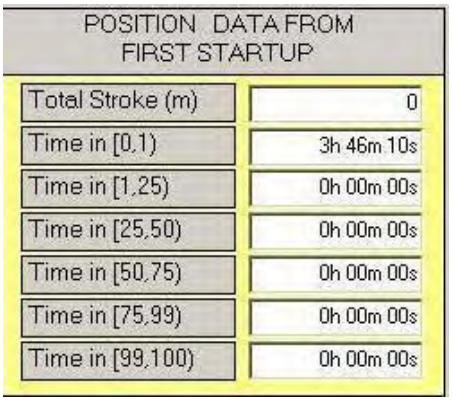
0 ÷ 1
1 ÷ 25
25 ÷ 50
50 ÷ 75
75 ÷ 99
99 ÷ 100

On the local control panel display the values expressed in hours are shown as it follows:

0-1 XXXXXXX.XXh
1-25 XXXXXXX.XXh
25-50 XXXXXXX.XXh
50-75 XXXXXXX.XXh
75-99 XXXXXXX.XXh
99-100 XXXXXXX.XXh

With ESC command, it is possible to return to the diagnostic menu.

On the PC, those values are available in the diagnostic page:



3.11.2 dP UP-DOWN

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
OK			**DIAGNOSTIC**
	↓		**STROKE KM**
	↓		**IN SVC HOURS**
	↓		**MIN TEMP.**
	↓		**MAX TEMP.**
	↓		**AVER.TEMP.**
	↓		**PERM. TIME**
	OK		**dP UP-DOWN**
		ESC	To return to menu

This selection shows the difference of actuator chamber pressure in each sector of the stroke for extending and retracting stem stroke.

On the local control panel the values are shown as below:

dP UP-DOWN Bar (or PSI)

1-25 XX.XX XX.XX
25-50 XX.XX XX.XX
50-75 XX.XX XX.XX
75-99 XX.XX XX.XX

With ESC command, it is possible to return to the diagnostic menu.

On the PC, those values are available in the diagnostic page:

Max Delta Pressure (bar)		
	Up	Down
[1,25)	0,00	0,00
[25,50)	0,00	0,00
[50,75)	0,00	0,00
[75,99)	0,00	0,00

3.11.3 ERROR STAT

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
OK			**DIAGNOSTIC**
	↓		**STROKE KM**
	↓		**IN SVC HOURS**
	↓		**MIN TEMP.**
	↓		**MAX TEMP.**
	↓		**AVER.TEMP.**
	↓		**PERM. TIME**
	↓		**dP UP-DOWN**
	OK		**ERROR STAT**
		ESC	To return to menu

In this menu the error quantity, the date and time of the last error occurred are stored for each event.

Inside this menu the following error events are listed:

TRIP1
TRIP2
TRIP3
TRIP4
PRESSURE FAIL
LOW SIGNAL FAIL
HIGH SIGNAL FAIL
POS. EXCESS ERROR
POS. EXCESS WARNING
PROBE ERROR
LOW POWER FAIL
HARD LIMITS ERROR
DSP TIMEOUT
WATCH DOG ERROR
HIGH POWER FAIL
ERROR ON SOV1
ERROR ON SOV2
ERROR ON SOV3
DSP RESTART
CALIBRATION ERASED
FREE 1
FREE 2
FREE 3
FREE 4
FREE 5
ENCODER ERROR
EXC. FRICTION ERROR

INDEX1 NOT FOUND ERR
INDEX2 NOT FOUND ERR

The selection can be made by selecting the line with the up / down buttons and pushing the OK key.

Once selected the event, the error counter and the last error date are shown:

TITLE (it is the selected variable in the previous list)

COUNTER: XXXXXXXXXX
LAST DATE: mm/dd/yyyy
hh:mm:ss

Press ESC or OK to return to the previous menu.

On the PC, the values are shown as below:

ALARM COUNTERS

	Counter	Last Date
Trip 1	1	04/01/2009 14:59:51
Trip 2	0	
Trip 3	0	
Trip 4	0	
Pressure	0	
Signal <min	0	
Signal >max	0	
Pos.Exc.Error	0	
Pos.Exc.Warn.	0	
Probe	1	04/01/2009 12:52:14
Power <min	0	
Hard Limits	0	
DSP Timeout	0	
Watch Dog	0	
Power >max	0	
Error On SOV 1	0	
Error On SOV 2	0	
Error On SOV 3	0	
DSP Restart	0	
Calib. Erased	0	
EEPROM 0	0	
EEPROM 1	0	
HC12 Restart	0	
EEPROMEXT 0	0	
EEPROMEXT 1	0	
Free 1	0	
Free 2	0	
Free 3	0	
Free 4	0	

ALARM COUNTERS

	Counter	Last Date
Free 5	0	
Calibr. Aborted	0	
0-Spool Error	0	
0-Spool Search	0	
Spool Limit	0	
Friction Warn.	0	
Encoder	0	
Friction Error	0	
Index 1	0	
Index 2	0	

3.11.4 CALIB STAT

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
OK			**DIAGNOSTIC**
	↓		**STROKE KM**
	↓		**IN SVC HOURS**
	↓		**MIN TEMP.**
	↓		**MAX TEMP.**
	↓		**AVER.TEMP.**
	↓		**PERM. TIME**
	↓		**dP UP-DOWN**
	↓		**ERROR STAT**
	OK		**CALIB STAT**
		ESC	To return to menu

This selection shows the operator the statistical information about the instrument calibration routine (calibration number and last date).

On the local control panel the following values are shown:

CALIBRATION

COUNTER: XXXXXXXXXX
LAST DATE: mm/dd/yyyy
hh:mm:ss

Press ESC or OK to return to the diagnostic menu.
On the PC, the values are shown as below:

SYSTEM COUNTERS

	Counter	Last Date
Calibration	0	
Out Service	0	
In Service	0	

3.11.5 OUT SVC STAT

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
OK			DIAGNOSTIC
	↓		STROKE KM
	↓		IN SVC HOURS
	↓		MIN TEMP.
	↓		MAX TEMP.
	↓		AVER.TEMP.
	↓		PERM. TIME
	↓		dP UP-DOWN
	↓		ERROR STAT
	↓		CALIB STAT
	OK		OUT SVC STAT
		ESC	To return to menu

This selection shows the operator the statistical information about the “out of service” system state (counter and last date).

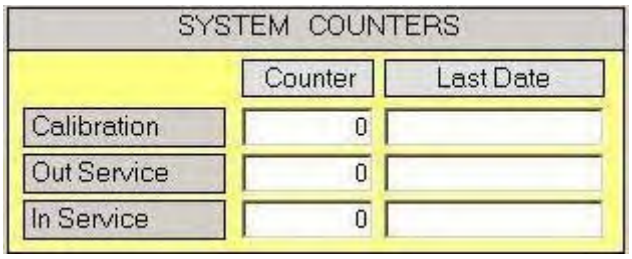
On the local control panel, the following data are shown:

OUT SVC

COUNTER: XXXXXXXXXX
LAST DATE: mm/dd/yyyy
hh:mm:ss

Press ESC or OK, to return to the diagnostic menu.

On the PC, the values are shown as below:



3.11.6 IN SVC STAT

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
OK			DIAGNOSTIC
	↓		STROKE KM
	↓		IN SVC HOURS
	↓		MIN TEMP.
	↓		MAX TEMP.
	↓		AVER.TEMP.
	↓		PERM. TIME

	↓		dP UP-DOWN
	↓		ERROR STAT
	↓		CALIB STAT
	↓		OUT SVC STAT
	OK		IN SVC STAT
		ESC	To return to menu

This selection shows the operator the statistical information about the “in service” system state (counter and last date).

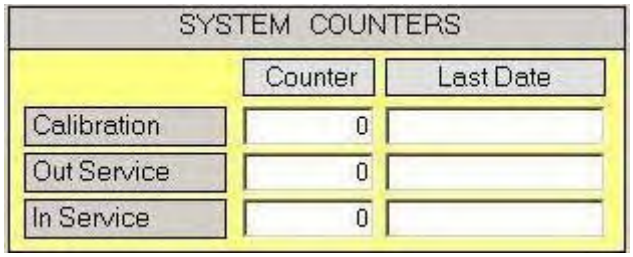
On the local control panel the following data are shown:

IN SVC

COUNTER: XXXXXXXXXX
LAST DATE: mm/dd/yyyy
hh:mm:ss

Press ESC or OK, to return to the Diagnostic menu.

On the PC, the values are shown as below:



3.11.7 STAT FREQ

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
OK			DIAGNOSTIC
	↓		STROKE KM
	↓		IN SVC HOURS
	↓		MIN TEMP.
	↓		MAX TEMP.
	↓		AVER.TEMP.
	↓		PERM. TIME
	↓		dP UP-DOWN
	↓		ERROR STAT
	↓		CALIB STAT
	↓		OUT SVC STAT
	↓		IN SVC STAT
	OK		STAT FREQ
		ESC	To return to menu

This selection allows to modify the storage frequency of the diagnostic data.

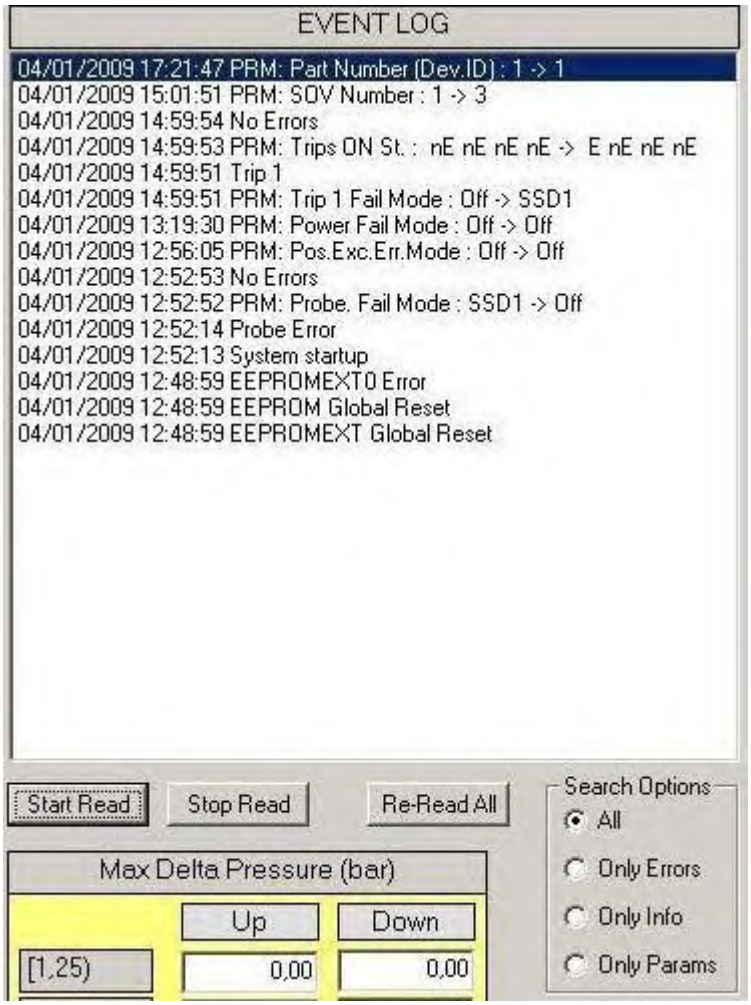
On the display, the following message appears:

STAT FREQ ON
01:00
PRESS OK TO CONFIRM

From this page, it's possible to change the storage frequency, using the ↑ / ↓ buttons, to confirm the value with the OK key or to cancel the selection pressing the ESC key.
Setting 00:00, the storage frequency is disabled.
It's not possible to change this parameter by remote, on the PC.

3.11.8 EVENT LOG

AVAILABLE ONLY ON PC SW. This function allow to read the history of events.



It is possible to configure the data that has to be displayed directly from the "Search Options" area. The options are: Only errors: will display only error conditions when present – Only info: will display the data only on a change of info condition – Only Params: will display only the parameters when change - All: will display all the events
Using the button is possible to start stop the reading or re-read all the history.

3.12 ADVANCED

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
↓			**DIAGNOSTIC**
OK			**ADVANCED**
	ESC		To return to main menu

This option allows to display the advanced menu data on PC software the advanced data and further configurations are inserted in ***STI MENU***.

In order to enter into this menu from the local panel, the advanced level password is required.

PASSWORD: *****

The device is supplied by the manufacturer with the default advanced level password:
[OK ↑ ↓ ↑ OK].
At the end of the login phase, the advanced menu will appear on the screen:

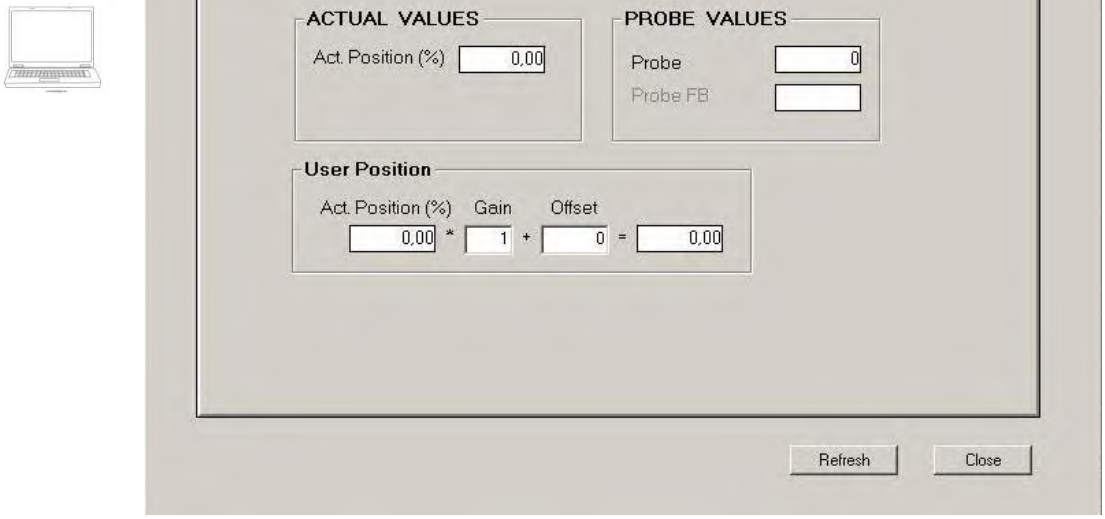
PROBE
MOTOR
SOV
4-20mA
PRESSURE
GENERAL

With the keys ↑ / ↓, it 's possible to shift on the demanded line, and pushing the OK button, it's possible to activate or change the selected option.

On PC software in order to access to ***STI MENU*** is necessary to log in as "advanced user" (password level 2) inserting the advanced level password that is **23456** by default.

At the end of the login phase, the STI button will appear on the screen:

On the PC, pushing the STI button, the following page is displayed:



It contains the advanced configuration parameters, the calibration data, some run-time information and the advanced function buttons divided on 6 different tags:

- Probe: probe configuration – probe settings – probe actual reading values
- Motor: Motor and encoder settings – motor manual control
- SOV: Solenoid valve check – SOV manual control
- 4-20mA: Analog input A/D converter reading – Analog outputs D/A converter calibration
- Pressure: Pressure sensors reading – Pressure A/D converter calibration
- General: New functions enable – Erase calibration – Reset device

3.12.1 PROBE

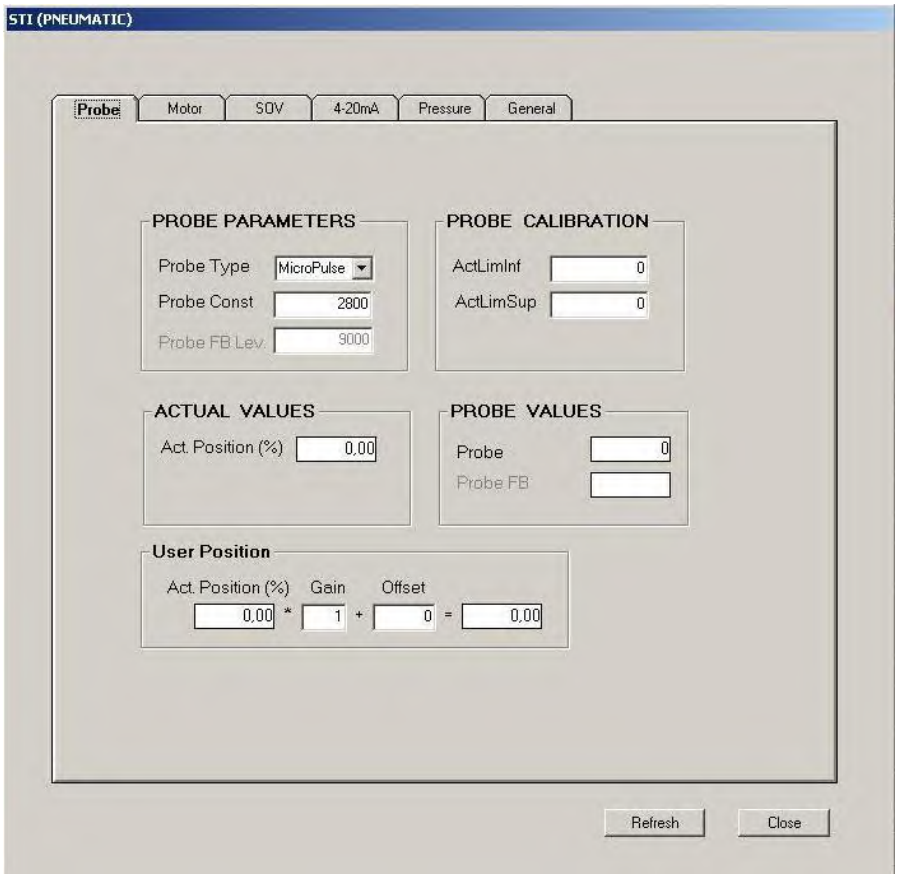
↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
↓			**DIAGNOSTIC**
OK			**ADVANCED**
	OK		**PROBE**
		ESC	To return to menu

Selecting PROBE will be displayed the probe configuration page

PROBE TYPE XXXXXX
PROBE CONST XXXX
PROBE FB LEVEL XXXX
ACTLIM INF XXXX
ACTLIM SUP XXXX

PROBE TYPE: With this command, it is possible to define the system probe selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are: MICROPULSE,4-20 mA, LVDT.
PROBE CONST: Allow to set the probe constant in order to have the right conversion between the probe reading value (Pulses) and the real stem movement value (millimetres or inches).
PROBE FB LEVEL: Shows the feedback level of the probe.
ACTLIM INF: Shows the probe reading lower limit found with the calibration.
ACTLIM SUP: Shows the probe reading upper limit found with the calibration.

On PC SW selecting the “Probe” label will be displayed:



Where are shown more information and functions
ACTUAL VALUES: is the position of the actuator expressed in %
PROBE VALUES: are the real time reading values related to probe signal

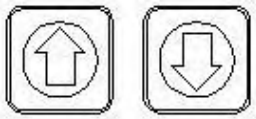
Starting from Release 4.01 the **User Position** function is implemented. It allows to customize the Analog feedback (Analog out A and B) using a *GAIN* factor that will be multiplied to the ACT % position and an *OFFSET* factor that will be added to the result between ACT % position multiplied to the Gain.

3.12.2 MOTOR

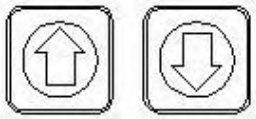
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
↓			DIAGNOSTIC
OK			ADVANCED
	↓		PROBE
	OK		MOTOR
		ESC	To return to menu

Selecting this option is possible to enter in the motor menu:

TH. 0 SPOOL XXXX
SPOOL LIMIT
STEP MOTOR
MOTOR TEST
STEP 0 XXXX
STEP 0N XXXX



STEP0P XXXX
POSINDEX0 XXXX
POSINDEXORI XXXX
MOTOR STEPS XXXX
ALIGN.STEPS XXXX
ENCODER XXXX



STEP MOTOR

TH. 0 SPOOL: Displays the theoretical 0 position of the spool. This value is related at the mechanical geometry of the spool.

SPOOL LIMIT: selecting this option with OK is possible to set the mechanical minimum and maximum limit.

SPOOL MIN LIMIT -XXXX
SPOOL MAX LIMIT XXXX

STEP MOTOR: Allows to enter the motor configuration data.

SPEED INI XX
SPEED MAX XX
ACC. TME XXX

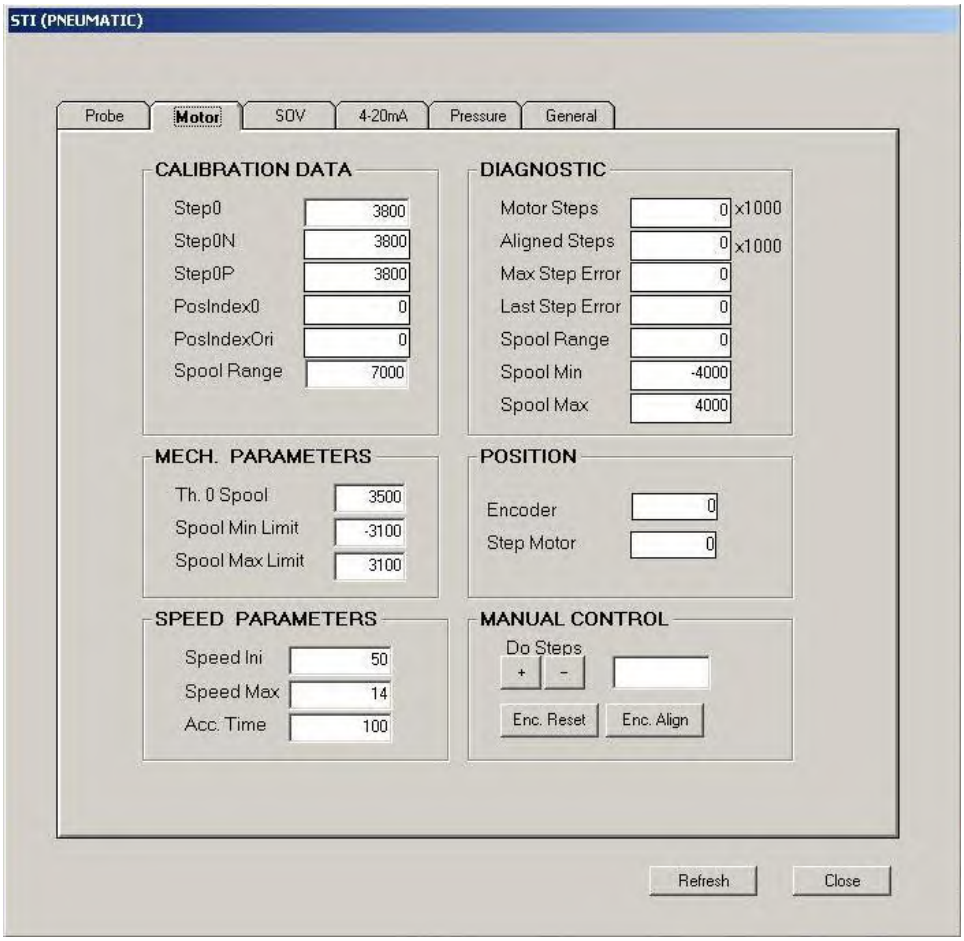
Warning: changing the motor configuration may generate errors on the spool and actuator movement or damage the motor and the spool.

MOTOR TEST: When the actuator is **NOT CALIBRATED** allows to test automatically the motor.

HARD LIMIT SEARCH
INDEX SEARCH
START MOTOR

STEP0: Displays the mechanical zero position found during the autocalibration.
STEP0N: Shows the negative point that is possible to reach with no movement on actuator.
STEP0P: Positive point that is possible to reach with no movement on actuator.
POSINDEX0: Display the index 0 position.
POSINDEXORI: Displays the origin index position.
MOTOR STEPS: Counter of motor steps (x 1000).
ALIGN STEPS: Counter of aligned steps (x 1000).
ENCODER: Actual encoder position.
STEP MOTOR: Actual step motor position.

On PC software the motor data are in **MOTOR** tag of STI **MENU.**



From this page when the system is **NOT CALIBRATED** and ONLY from PC software is possible to move manually the step motor. To drive it manually insert the number of steps to be drived in MANUAL CONTROL

area and click on + or - button the motor will move according with the direction selected pushing the button. To check if the motor moved check the POSITION area that will shows the motor and encoder position. The values of Encoder and Step Motor HAS to be aligned (max error 100 unit).

In manual control is suggested to insert a low number of steps (100 – 200) and drive the motor only a few times per each direction in order to avoid to reach the mechanical limit with the spool.
If it happen driving a step the value of step motor in position area will increase but the encoder will stay in the same position. To fix the phase displacement it is possible to use the buttons ENC RESET and ENC ALIGN. ENC RESET will reset the value of Encoder and Step motor position.
ENC ALIGN will set the encoder value as the step motor value.

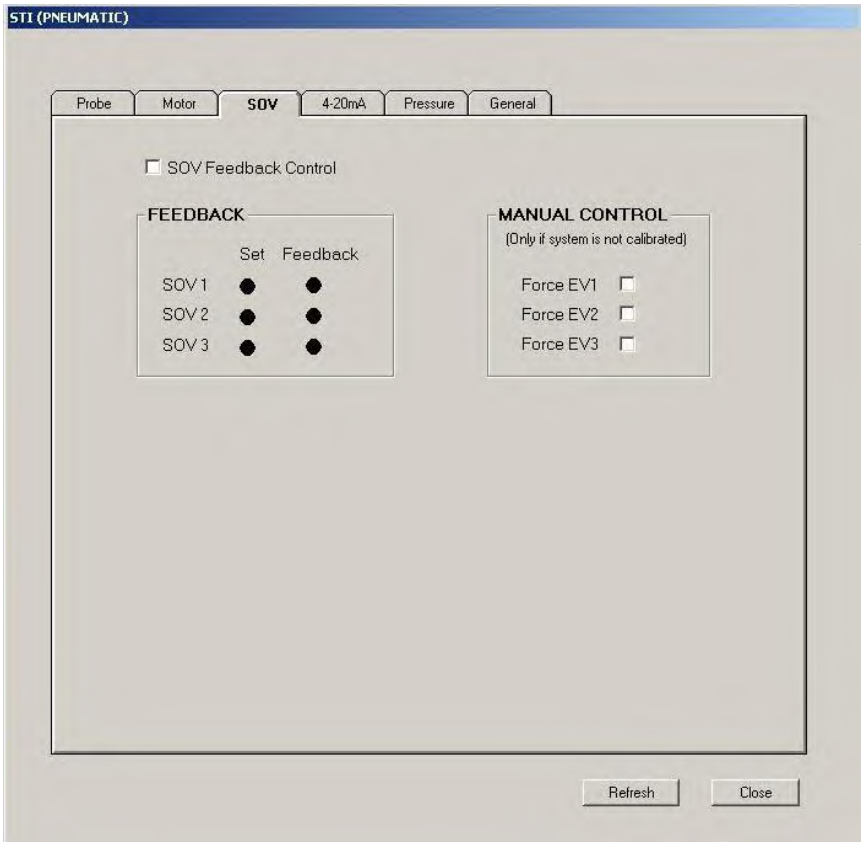
3.12.3 SOV

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
↓			**DIAGNOSTIC**
OK			**ADVANCED**
	↓		**PROBE**
	↓		**MOTOR**
	OK		**SOV**
		ESC	To return to menu

From controller panel is possible to set only the SOV feedback.

SOV FEEDBACK XXXXXXX

On PC software is also possible to activate manually the solenoid valves using the command Force EV in manual control.



CAUTION: Forcing the solenoid valves may let the valve move unexpectedly.
The plant operator has the responsibility to make sure that the process valve, will not cause any damage to property or personnel before issuing the "FORCE EV" command. This includes making sure that personnel and equipment are clear of moving parts of the cylinder and process valve and that the plant process has been made safe by bypassing the process valve.

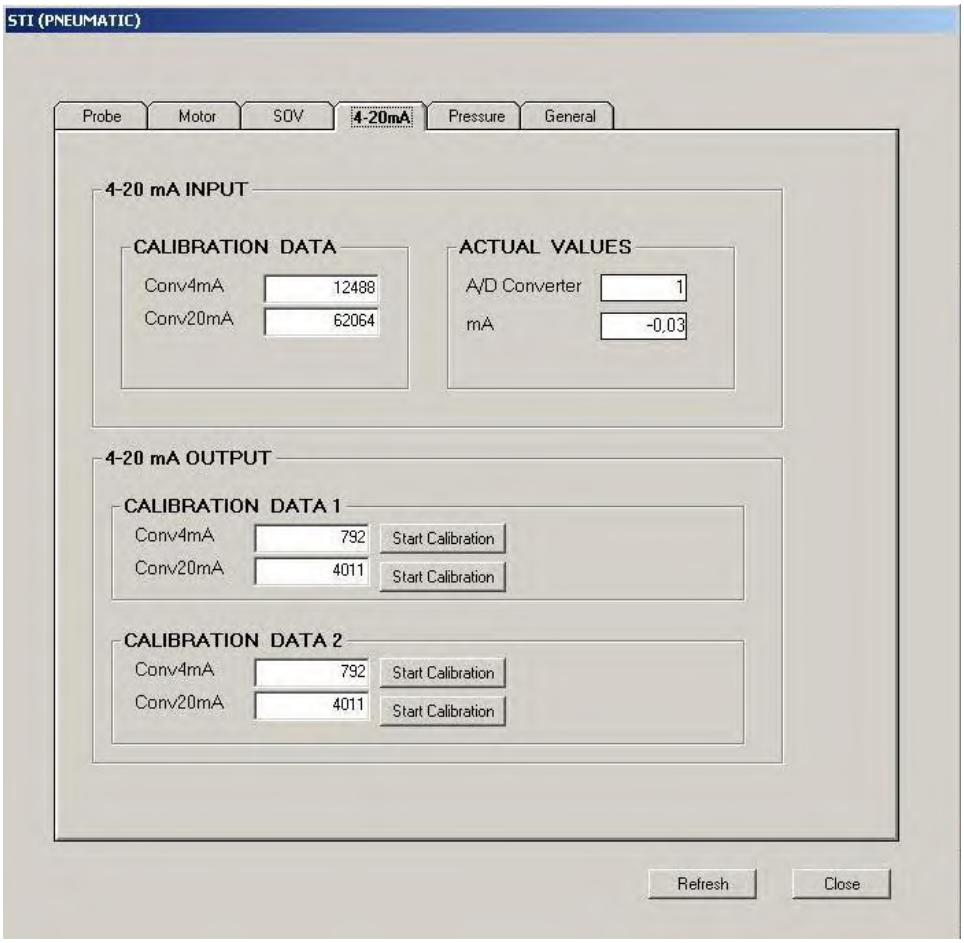
3.12.4 4-20 mA

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
↓			**DIAGNOSTIC**
OK			**ADVANCED**
	↓		**PROBE**
	↓		**MOTOR**
	↓		**SOV**
	OK		**4-20mA**
		ESC	To return to menu

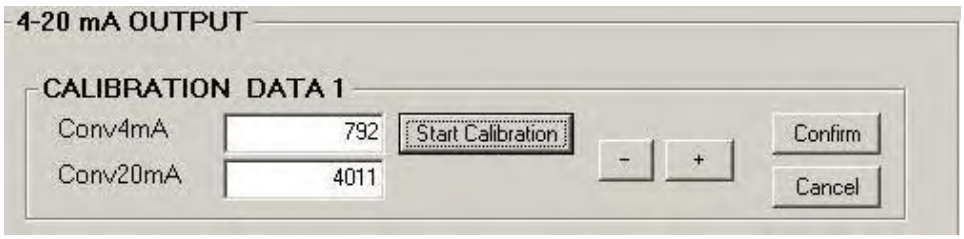
With this command, it is possible to see the 4-20 mA values.

INP CONV4mA XXXXX
INP CONV20mA XXXXX
OUT1 CONV4mA XXXXX
OUT1 CONV20mA XXXXX
OUT2 CONV4mA XXXXX
OUT2 CONV20mA XXXXX

From remote control software is possible to read the values of input analog to digital converter and calibrate the analog outputs.



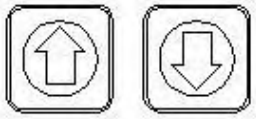
To calibrate the outputs is necessary to connect the measuring instrument to the related output and press the start calibration button, read the output value on the instrument and modify the output clicking on – or + buttons. Once found the right value push Confirm. Cancel to abort the calibration.



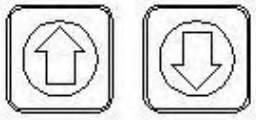
3.12.5 PRESSURE

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
↓			**DIAGNOSTIC**
OK			**ADVANCED**
	↓		**PROBE**
	↓		**MOTOR**
	↓		**SOV**
	↓		4-20mA
	OK		PRESSURE
		ESC	To return to menu

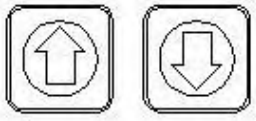
PI – SRC P1 XXXXX
PI – SRC P2 XXXXX
PI – SRC P3 XXXXX
PI – TRG P1 XXXXX
PI – TRG P2 XXXXX
PI – TRG P3 XXXXX



PA – SRC P1 XXXXX
PA – SRC P2 XXXXX
PA – SRC P3 XXXXX
PA – TRG P1 XXXXX
PA – TRG P2 XXXXX
PA – TRG P3 XXXXX



PB – SRC P1 XXXXX
PB – SRC P2 XXXXX
PB – SRC P3 XXXXX
PB – TRG P1 XXXXX
PB – TRG P2 XXXXX
PB – TRG P3 XXXXX

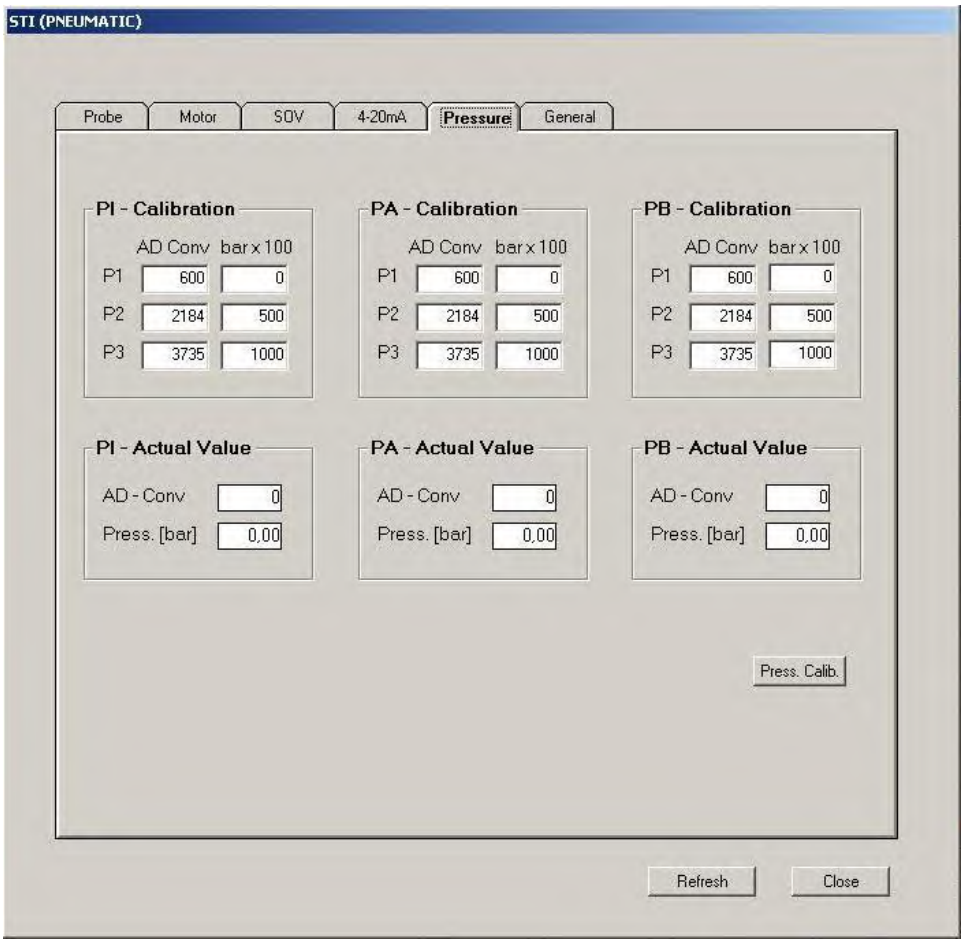


PI CALIB
PA CALIB
PBCALIB

- **PI – Src P1:** it's the lower value of PI-SUPPLY expressed in A/D converter points used to calibrate this pressure transducer
- **PI – Src P2:** it's the middle value of PI-SUPPLY expressed in A/D converter points used to calibrate this pressure transducer
- **PI – Src P3:** it's the higher value of PI-SUPPLY expressed in A/D converter points used to calibrate this pressure transducer
- **PI – Trg P1:** it's the lower value of PI-SUPPLY expressed in measurement units (bar, Psi) used to calibrate this pressure transducer

- **PI – Trg P2:** it's the middle value of PI-SUPPLY expressed in measurement units (bar, Psi) used to calibrate this pressure transducer
- **PI – Trg P3:** it's the higher value of PI-SUPPLY expressed in measurement units (bar, Psi) used to calibrate this pressure transducer
- **PA – Src P1:** it's the lower value of PA-SUPPLY expressed in A/D converter points used to calibrate this pressure transducer
- **PA – Src P2:** it's the middle value of PA-SUPPLY expressed in A/D converter points used to calibrate this pressure transducer
- **PA – Src P3:** it's the higher value of PA-SUPPLY expressed in A/D converter points used to calibrate this pressure transducer
- **PA – Trg P1:** it's the lower value of PA-SUPPLY expressed in measurement units (bar, Psi) used to calibrate this pressure transducer
- **PA – Trg P2:** it's the middle value of PA-SUPPLY expressed in measurement units (bar, Psi) used to calibrate this pressure transducer
- **PA – Trg P3:** it's the higher value of PA-SUPPLY expressed in measurement units (bar, Psi) used to calibrate this pressure transducer
- **PB – Src P1:** it's the lower value of PB-SUPPLY expressed in A/D converter points used to calibrate this pressure transducer
- **PB – Src P2:** it's the middle value of PB-SUPPLY expressed in A/D converter points used to calibrate this pressure transducer
- **PB – Src P3:** it's the higher value of PB-SUPPLY expressed in A/D converter points used to calibrate this pressure transducer
- **PB – Trg P1:** it's the lower value of PB-SUPPLY expressed in measurement units (bar, Psi) used to calibrate this pressure transducer
- **PB – Trg P2:** it's the middle value of PB-SUPPLY expressed in measurement units (bar, Psi) used to calibrate this pressure transducer
- **PB – Trg P3:** it's the higher value of PB-SUPPLY expressed in measurement units (bar, Psi) used to calibrate this pressure transducer

On remote control software the related page is in STI expert menu Pressure tag.



On display selecting the PI CALIB function, the following menu appears on the display:

PI-P1 CALIB.
PI-P2 CALIB.
PI-P3 CALIB.

With this command, selecting the required point, it's possible to calibrate the SUPPLY-PI pressure signal.

PI-P1
0.00 Bar
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ in a range between 0÷150 Psi or 0÷10 bar and subsequently confirmed with OK. Press ESC to return to the previous menu.

This function is available on PC software from the STI menu, pushing the Calib. Button.

To calibrate the pressure signal, select the pressure transducer type (PI/PA/PB), input the value in the required empty cell and press the corresponding Calib. button.

Selecting PA-CALIB function, the following menu appears on the display:

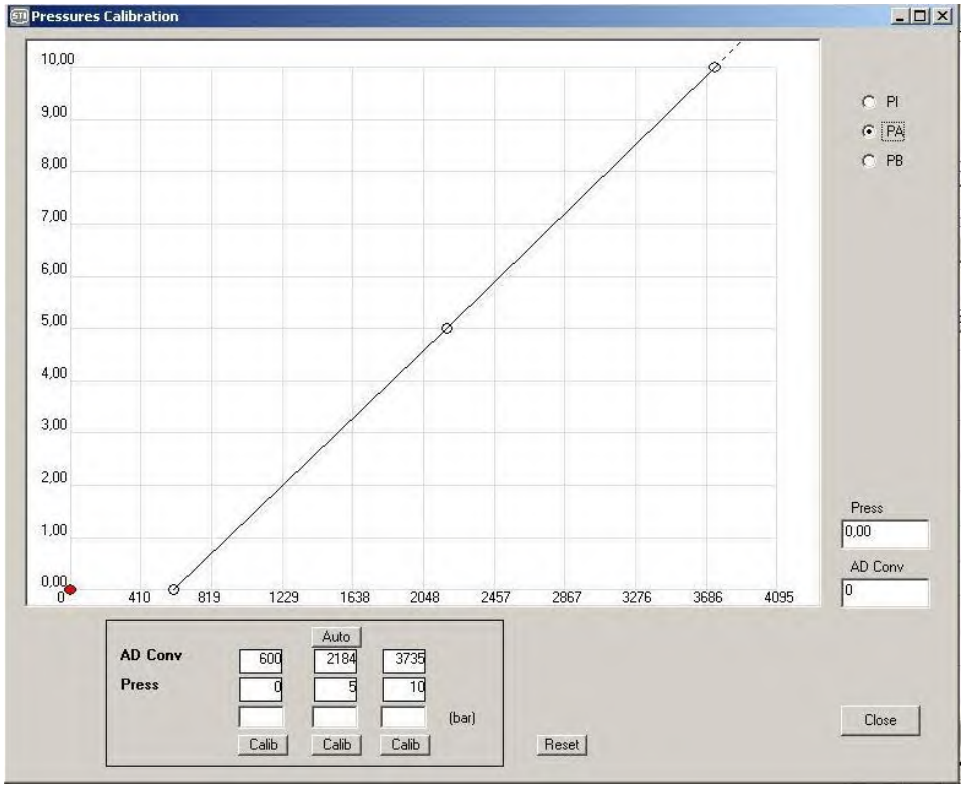
PA-P1 CALIB.
PA-P2 CALIB.
PA-P3 CALIB.

With this command, selecting the required point, it's possible to calibrate the OUT1-PA pressure signal.

PA-P1
0.00 Bar
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ in a range between 0÷150 Psi or 0÷10 bar and subsequently confirmed with OK. Press ESC to return to the previous menu.

This function is available on PC software from the STI menu, pushing the Calib. Button.



To calibrate the pressure signal, select the pressure transducer type (PI/PA/PB), input the value in the required empty cell and press the corresponding Calib. button.

This function is available on PC software from the STI menu, pushing the Press. Calib. Button.

Selecting this function, the following menu appears on the display:

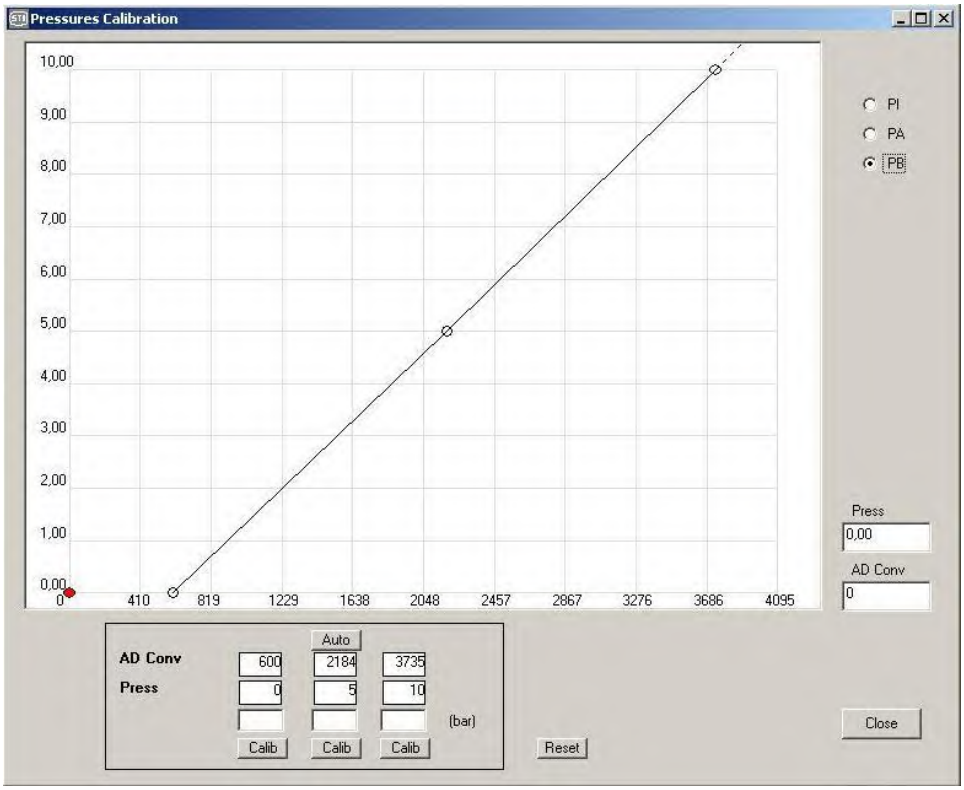
PB-P1 CALIB.
PB-P2 CALIB.
PB-P3 CALIB.

With this command, selecting the required point, it's possible to calibrate the OUT1-PA pressure signal.

PB-P1
0.00 Bar
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ in a range between 0÷150 Psi or 0÷10 bar and subsequently confirmed with OK. Press ESC to return to the previous menu.

This function is available on PC software from the STI menu, pushing the. Calib. Button.



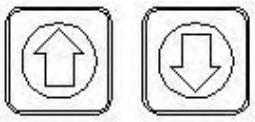
To calibrate the pressure signal, select the pressure transducer type (PI/PA/PB), input the value in the required empty cell and press the corresponding Calib. button.

3.12.6 GENERAL

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
↓			**DIAGNOSTIC**
OK			**ADVANCED**
	↓		**PROBE**
	↓		**MOTOR**
	↓		**SOV**
	↓		4-20mA
	↓		PRESSURE
	OK		GENERAL
		ESC	To return to menu

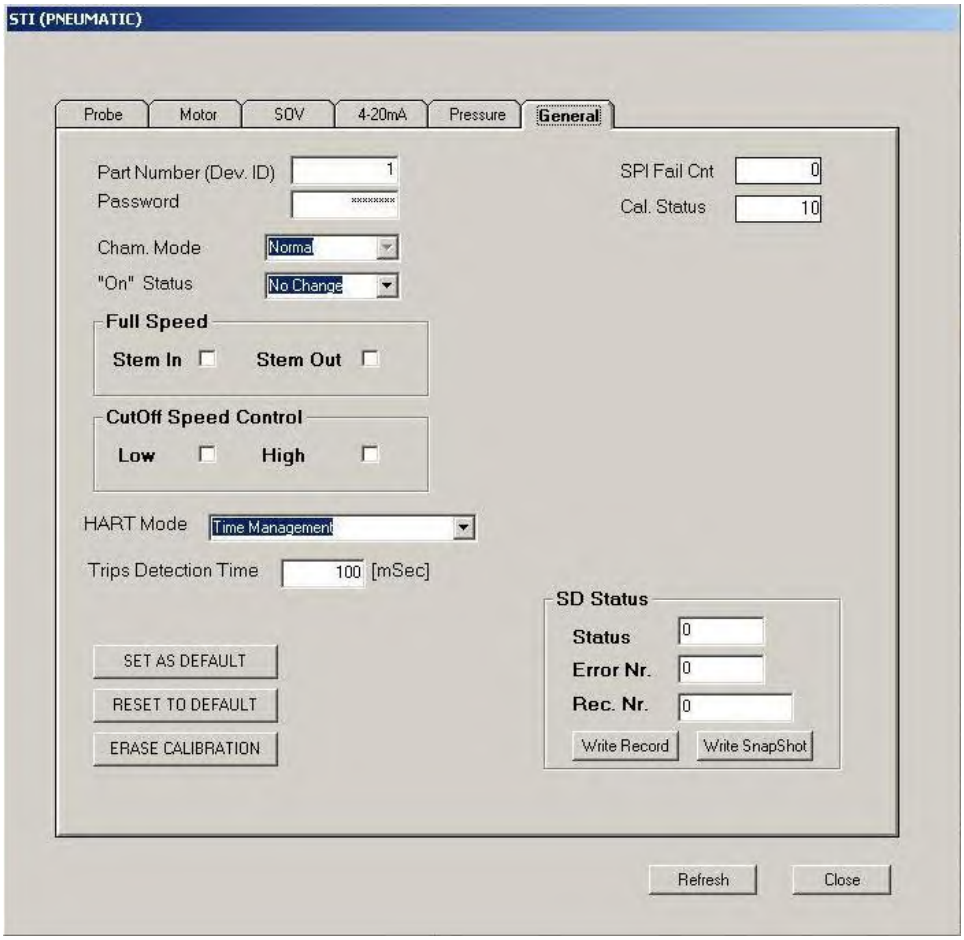
With this command, it is possible to enter the General setting menu:

PART NUMBER XX
PASSWORD
CHAM MODE XXXXX
FULL SPEED XXXXX
ON MODE XXXXX
P1-P3



SET AS DEFAULT
ERASE CALIB
RESET STAT&LOG
STAT DEBUG
HART DEBUG

On PC software the function are available in General tag in STI menu page.



3.12.6.1 PART NUMBER

With this command, it is possible to modify the QuickTrak III part number, in a range of 1÷32767.
In the HART Protocol this number corresponds to the Device ID.

The following page is displayed:

PART NUMBER
1
PRESS OK TO CONFIRM

In this page with the 4 keys enabled, it's possible:

- to change the proposed value increasing it with the STEM □ and decreasing it with the STEM □;
- to cancel the possible changes and return to the Advanced submenu with the ESC key;
- to confirm the inserted value by pressing OK.

To change the parameter from PC software from the STI menu double click on parameter and type the new value.

To set the value, double click on the corresponding cell, input the value and press "OK" to confirm it or "Cancel" to exit from the input window.

3.12.6.2 PASSWORD

With this selection, it's possible to change the advanced level password.

The following page is displayed:

PASSWORD: _ _ _ _ _
CONFIRM: _ _ _ _ _

A sequence of 5 push buttons is required to define this password, used to enter the advanced menu from the local panel (the device is supplied by the manufacturer with the default advanced password [OK ↑ ↓ ↑ OK]).

This function is available on PC software from the STI menu.

To set the value, double click on the corresponding cell, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.

3.12.6.3 CHAMBER MODE

This function is related at the piping of the actuator. It is auto defined during the Calibration

3.12.6.4 FULL SPEED

Starting from DSP release 4.01 is available the FULL SPEED mode. This function has been inserted in order to increase the performance of the actuator on full stroke movement. When the actuator position is on a limit (0% or 100%) and a full stroke is requested the positioner full pressurize the related chamber bypassing all the tuning parameter.
Different settings are available

- Not enabled
- Stem in only
- Stem out only
- Both direction

On PC software is possible to set the function clicking the needed function

3.12.6.5 ON MODE

Starting from DSP release 4.01 is available the ON MODE function.
This option allows to select the status on power up. Is possible to choose between three parameters:

- NO CHANGE
- OUT OF SERVICE
- IN SERVICE

NO CHANGE: on power up the last status before the switch off is maintained
OUT OF SERVICE: on power up the service status will be set in OUT OF SERVICE mode
SERVICE: on power up the service status will be set in IN SERVICE mode

On PC software just select the needed function

3.12.6.6 P1-P3

PARAMETER NOT USED.

3.12.6.7 SET AS DEFAULT

All the actual parameters set on positioner will be saved in internal memory as default.

3.12.6.8 ERASE CALIBRATION

With this function is possible to erase the calibration data.

3.12.6.9 RESET STAT&LOG

Allows to erase the statistics and event log file.

3.12.6.10 STAT DEBUG

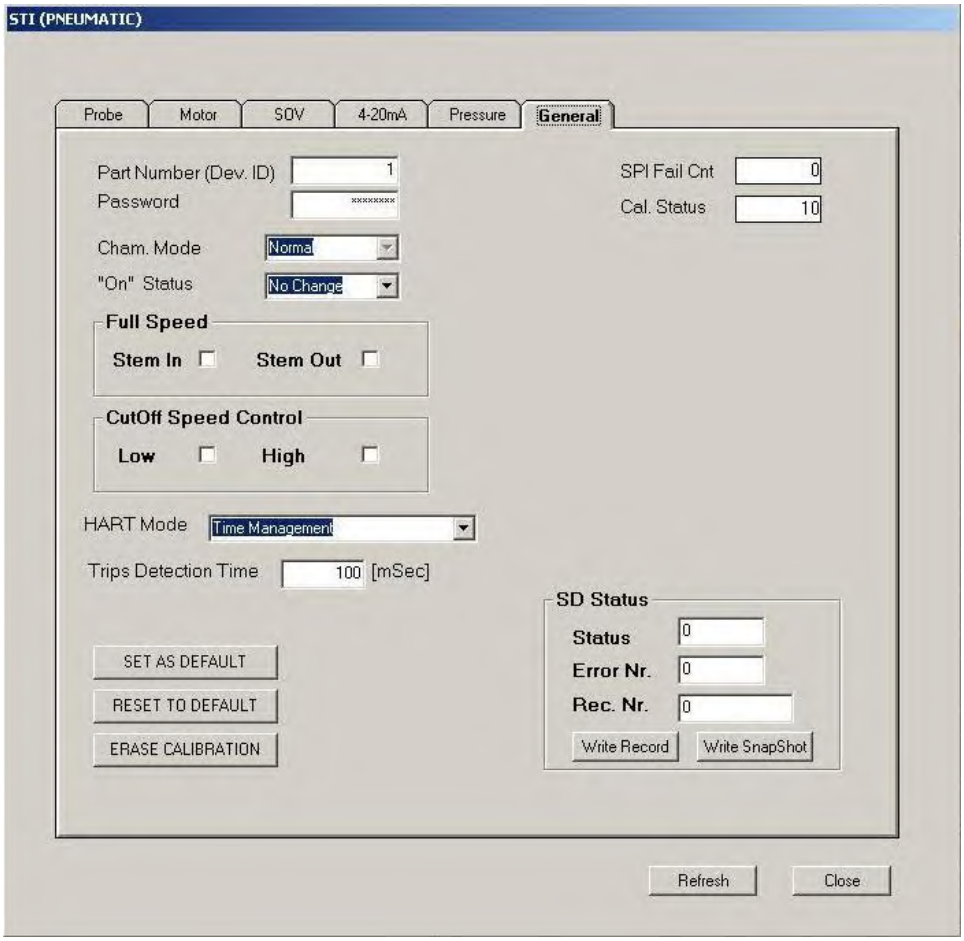
Reserved debug page containing information about the statistical calculation and the recording time in External EEPROM.

3.12.6.11 HART DEBUG

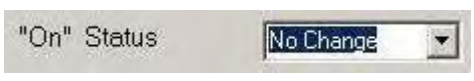
Reserved debug page containing information about the input/output HART frames.

3.12.7 REMOTE CONTROL SW >>> STI PAGE >>> GENERAL TAG

On GENERAL tag of STI PAGE are available NEW OPTIONS included since Version 4.01



3.12.7.1 ON STATUS



This option allows to select the status on power up. Is possible to choose between three parameters:

- NO CHANGE
- OUT OF SERVICE
- IN SERVICE

NO CHANGE: on power up the last status before the switch off is maintained
OUT OF SERVICE: on power up the service status will be set in OUT OF SERVICE mode
SERVICE: on power up the service status will be set in IN SERVICE mode

3.12.7.2 FULL SPEED

This function has been inserted in order to increase the performance of the actuator on full stroke movement. When the actuator position is on a limit (0% or 100%) and a full stroke is requested the positioner full pressurize the related chamber bypassing all the tuning parameter. To enable the function flag the related direction.

3.12.7.3 CUT OFF SPEED CONTROL

This function works linked with the STROKE time function (SEE RELATED CHAPTER). When selected one or both of these options (Cut off speed control on Low position Cut Off or/and High position Cut OFF), if a Cut off position is selected and a stroke time is set the actuator will move according to the stoke time. This function is used to maintain the cut off function and the linearity request for the stoking time

3.12.7.4 TRIPS DETECTION TIME

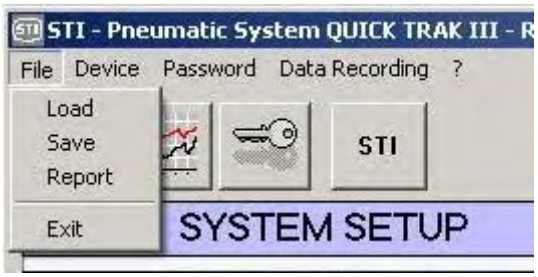
This function allows to set a delay time on the detection of the error condition due to a trip signal

3.13 REMOTE CONTROL SW >>> TOOLBAR OPTIONS

From software toolbar is possible to select different functions contained in menus:

- File
- Device
- Password
- Data recording

3.13.1 FILE MENU



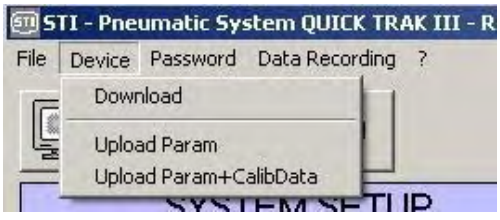
The available functions are:

- **Load:** allows to load a saved parameter file

Once load a file the background of the program window changes color

- **Save:** saves the on-line parameters. The extension of the file is .qtp
- **Report:** creates a text file with all the positioner parameters
- **Exit:** close the program

3.13.2 DEVICE MENU



In this menu the available options are

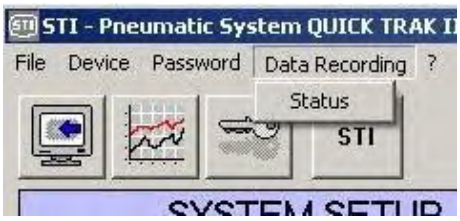
- **Download:** read the parameters from the positioner
- **Upload Param:** this function is available starting from password level 1 and it allows to send form the PC to the positioner the configuration data loaded from a file (backup file)
- **Upload Param + CalibData:** This function is available with password level 2 and it allows to send from

the PC to the positioner the configuration data and the calibration data loaded from a file. *NOTE: it is ever suggested upload ONLY the parameters and perform an auto-calibration*

3.13.3 PASSWORD MENU

- **Login:** Used to login in to the sw. Password level1: 12345 Password level2: 23456
- **Change:** allows to change the password

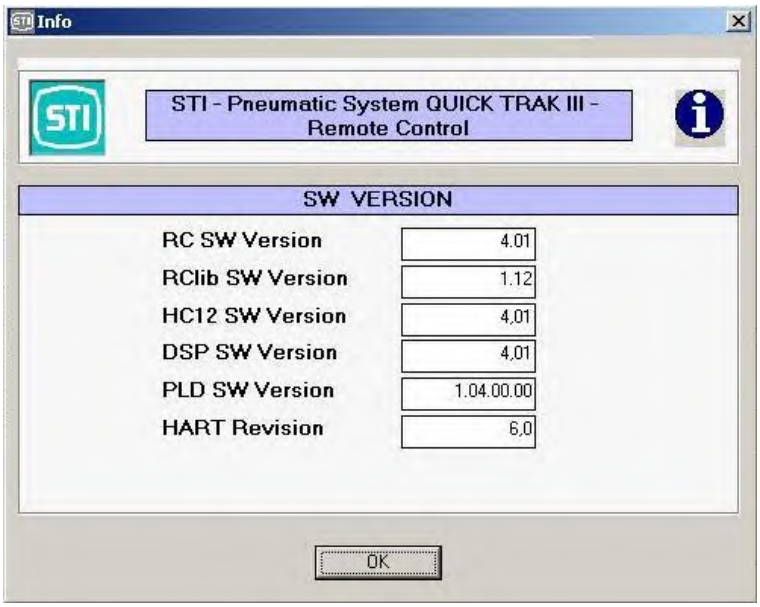
3.13.4 DATA RECORDING MENU



Allows to save on pc a log file.

3.13.5 INFO MENU

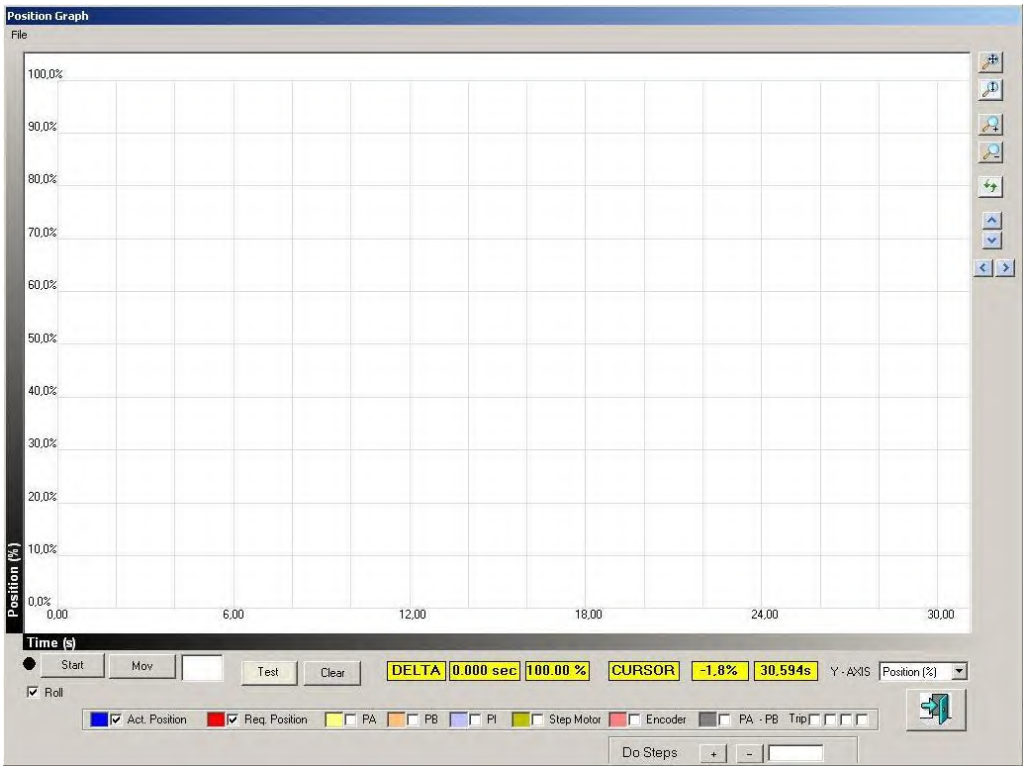
Selecting info menu is possible to display the release of the positioner.



4 GRAPH

This feature allows user to record set point and position signal waveforms for 10 seconds. Moreover, it comes with some tools to analyze the acquired waveforms. This feature is available just on the “Remotectrl” program.
To enable this feature, user must put the system into MANUAL mode. Open the Graph window clicking the GRAPH button on the remote control panel.

Below a detailed description of the available GRAPH tools:



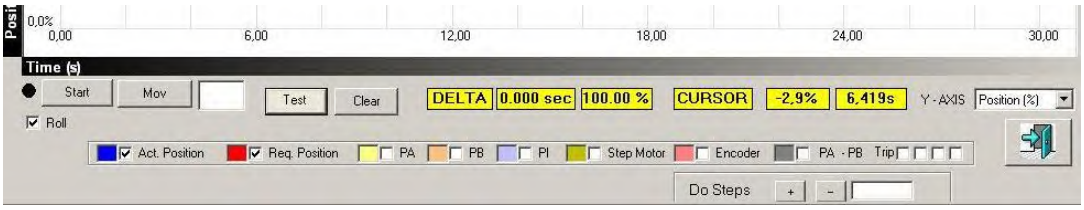
The GRAPH tool allows to check the performances of all actuator parameters.

Selecting the options in the lower area of the GRAPH is possible to select the options that has to be shown.

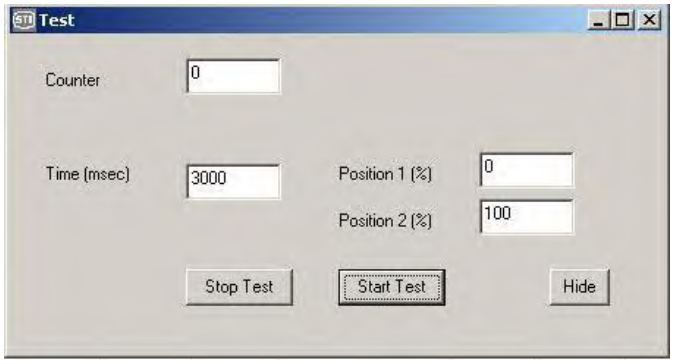
The available options are:
Act. Position: Is the actual position
Req. Position: Is the request position
PA: Is pressure in chamber A
PB: Is pressure in chamber B
PI: Is Supply pressure
Step Motor: It shows the steps of the motor
Encoder: Is the encoder position
PA - PB: Is the Delta (differential) pressure between chamber A and chamber B

Trip: Shows Trips 1,2,3,4 (selecting from left to right)

Once selected the graph options is necessary to press the “Start” button to start the monitoring of the parameters. The default scanning time is 30 seconds but using the “Roll” option (located under start button) the scanning will not stop until the closing of graph page or removing the Roll flag.



In order to deep analyze the performances of the actuator are available some functions to check easily the parameters.
Cursor position: Moving the cross cursor on the graph area is possible to read the cursor position (Y,X) in the yellow area named “CURSOR”.
Delta measuring: Is possible to measure the distance between two points on the graph. Move the cross cursor on the first point, push and hold the right mouse button, move the cursor on the second point and release the right button. In DELTA yellow area will be possible to read the last sampling. While holding the button a line appears to identify the measuring delta.
Y – AXIS configuration: It allows to select the measuring unit for Y axe. It is possible to select between “Position (%)”, “pressure (bar)” or “Motor steps”. The Y axis is auto rescaled according to the measuring unit.
Mov button (manual movement): When the service status is in MANUAL mode is possible to move the actuator directly from the graph. Insert the desired position in the MOV area (near the button) and click on MOV button.
Test button: Function available ONLY in MANUAL mode. With this function is possible to let the actuator moving automatically to 2 defined position with a pre-set delay time.



Clear button: allows to clean the screen.
Do steps: ONLY WHEN NOT CALIBRATED. Is possible to manual drive the motor directly from the graph like in STI expert menu. Insert the number of steps to do and press Do Steps. Remember to insert a low number of step to avoid spool crashes. SEE related chapter (STI menu -> MOTOR tag) for more information.

Zoom function: selecting an area on the graph is possible to zoom in. To do it move the cross cursor on the left- top corner of the desired area to zoom in, push and hold the left button, move the mouse to the right-down corner of the area. While holding the button a box appears to identify the zoom area. On the left-top corner of the graph area are available further zoom tools

Zoom all: full scale zoom

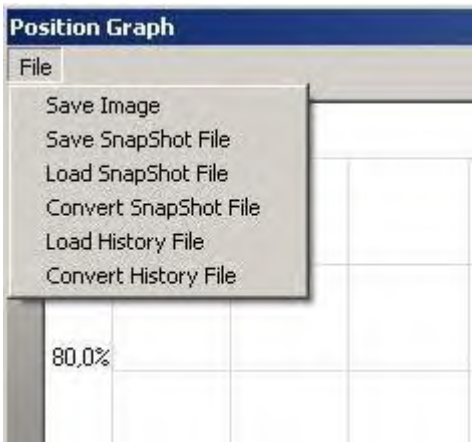
Zoom Y axis: full scale zoom on Y axis, X axis remain the selected

Zoom in – Zoom out

Refresh graph data

Scroll buttons: Allow to scroll the graph in each direction, is also possible to use the arrow keys on keyboard

In graph page it is possible also to use the file function



The options available are:

- **Save Image:** saves the actual measuring screen as bitmap image
- **Save Snapshot File:** saves the actual measuring screen as binary file (.bin extension). Into the file are saved all the actuator parameters.
- **Load Snapshot File**: load a stored binary file. Once loaded the file is possible to full analyze the graph (show or hide parameters, zoom, measure) like in on-line graph
- **Convert Snapshot File:** convert the snapshot binary file in a .csv file (excel extension)
- **Load History File:** Load an history file stored in the SD CARD (SEE RELATED CHAPTER) . Opening the file is possible to select the portion of the historical file to be displayed
- **Convert History File:** Convert the history file stored in SD CARD in a .csv file.

5 TROUBLE SHOOTING

Problem description	Cause	Solution
The controller doesn't switch on	• The power is not connected • The power supply voltage is out of the admissible range (+/-10%) • The main power switch inside the controller is OFF • The fuses are blown • Some wiring is not properly done either inside the controller or in the step motor enclosure • There is a short circuit on some of the devices connected to the controller	• Connect the power • Check the power supply voltage value with a multimeter • Switch on the main power switch • Replace the fuses • Check the wiring using the electrical diagram and that the connector to step motor, encoder and pressure transducers is properly plugged. • Disconnect all the terminal boards connected to these device and check whether the controller switches on.
Probe error E10	• Some wiring is not properly done • The software selection in STI menu of the used probe is not correct • The probe has been calibrated with a shorter stroke process valve • The probe is damaged	• Check the wiring • Check that the software setting corresponds to the used probe • Erase the previous calibration and perform a new calibration • Replace the probe
Red light flashing on motor-driver electronic board	• The step motor connector is not properly plugged • The wiring is not properly done • There is an excessive friction on the spool valve driven by the step motor	• Check the connector plug • Check the wiring • Check that the spool valve can slide smoothly and in STI menu the difference between step motor and encoder steps is not too big
A change in the valve position set point doesn't affect the actuator's position	• The air supply pressure value is too low • The spool valve is sticking • The parameters configuration is not correct • Actuator and/or jammed valve • Signal wires are not properly connected • Circuit boards are defective • Calibration and tuning have not been carried out • Device is in "manual" or "out of service" mode • Device is in fail safe status	• Check the air supply pressure value • Check that the spool valve can slide smoothly and in STI menu the difference between step motor and encoder steps is not too big • Check gain and dead band values • Check that the actuator can move in a continuous way and not in steps • Check signal wires • Replace circuit boards • Perform a calibration and make the proper tuning • Set the system in "in service" mode • Check whether the solenoid valve making the fail safe mode is energized
Overshooting or positioning too slow	• Incorrect tuning in terms of dead band and gain • The spool valve is sticking • Too small air tubing or dirty air filter • Leakages in air tubing and manifold connections • Process valve is sticking	• Change the dead band and gain values • Check that the spool valve can slide smoothly and in STI menu the difference between step motor and encoder steps is not too big • Check air tubing size with the factory and inspect air filter • Check leakages in air tubing and manifold connections • Check process valve
E05	Pressure fail	• Check air supply line • Check that the air filter regulator is

		properly set • Check that the wiring to air supply pressure transducer
E06	Low signal fail limit	• Check that the signal wires are properly connected to the terminal board • Check with a multimeter the value of the signal • Check that the internal flat cables between the two terminal boards are properly connected
E07	High signal fail limit	• Check that the signal wires are properly connected to the terminal board • Check with a multimeter the value of the signal • Check that the internal flat cables between the two terminal boards are properly connected
E08	Position excess error	See point 4. of this table
E09	Position excess warning	See point 4. of this table
E10	Probe error	Check wiring connection. Control if the connector is properly connected, and check probe supply.
E11	Low power fail	• Check that the power wires are properly connected to the terminal board • Check with a multimeter the value of the power supply • Check that the fuses are not blown
E12	Hard limits error	• Check the probe is working properly • Check that the air supply value is not too low
E13	DSP timeout	Replace the display electronic board
E14	Watch dog error	Replace the display electronic board
E15	High power fail	• Check that the power wires are properly connected to the terminal board • Check with a multimeter the value of the power supply
E16	Error on solenoid valve SOV1	• Check that the solenoid valve's coil is not burnt • Check the wiring between the solenoid valve and the controller if the solenoid valve is supposed to be energized check that the yellow light on the side of the SOV1 connector is ON.
E17	Error on solenoid valve SOV2	• Check that the solenoid valve's coil is not burnt • Check the wiring between the solenoid valve and the controller if the solenoid valve is supposed to be energized check that the yellow light on the side of the SOV2 connector is ON.

E18	Error on solenoid valve SOV3	• Check that the solenoid valve's coil is not burnt • Check the wiring between the solenoid valve and the controller • If the solenoid valve is supposed to be energized check that the yellow light on the side of the SOV3 connector is ON.
E19	DSP restart	• Restart again the controller and check whether the error is cleared • Replace the display electronic board
E20	Calibration erased	• This is a warning message used to inform that a calibartion parameters reset has been performed by the operator
E21	EEprom Error 0	• If the controller is locked try to restart. If the problem remains change the display electronic board
E22	EEprom Error 1	• If the controller is locked try to restart. If the problem remains change the display electronic board
E23	HC12 Restart	• Restart again the controller and check whether the error is cleared • Check the power supplay cable of display board • Replace the display electronic board
E24	EEprom Ext Error 0	• If the controller is locked try to restart. If the problem remains change the display electronic board
E 25	EEprom Ext Error 1	• If the controller is locked try to restart. If the problem remains change the display electronic board
E26	Probe Out of Range	• Check the stoke length and perform a new calibration
E31	Calibration aborted	• During the calibration something aborted the process. Fix the problem and perform a new calibration
E32	Zero spool error	• Check if the spool is free to move on all length
E33	Zero spool searching	• Warning message. Second try to find the zero spool during start-up
E34	Spool limit Error	• Check if the spool is free to move on all length
E35	Friction warning	• Warning message related to the spool movement
E36	Encoder Error	• Check if the motor move • Check if the encoder is correctly fixed on the motor • Check the motor and encoder wirings
E37	Friction Error	• Check if the motor move • Check if the spool can move free on all length • Check if the encoder is correctly

		fixed on the motor • Check the motor and encoder wirings • Check the motor steps and encoder signal
E38	Encoder Index Error	• Check if the spool is free to move. Perform a new calibration
E39	Encoder Index2 Error	• Check if the spool is free to move. Perform a new calibration
E41	Wait ack	• Waiting for acknowledge after an error condition with end mode set to “Wait ack”
E42	External Solenoid	• A trip signal is detected on an input configured as “External solenoid”
E43	System Version	• Check the DSP and HC12 version • Update the fw version

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Information in this document may be modified at any time without notice.

User manual

(QuickTrakIII Hydraulic Only)

Referred to:

HC12 software revision starting from 5.19 (H)
DSP software revision starting from 5.31 (H)
RC software revision starting from 5.27 (H)
PLD software revision starting from 1.04.00.00

Starting from release 5.00 new functions are available:

FIRST RELEASE	-	-	-

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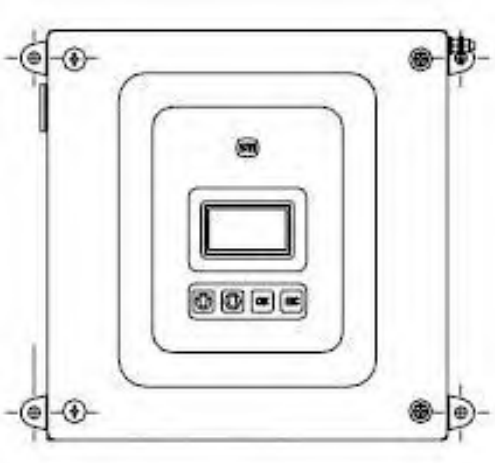
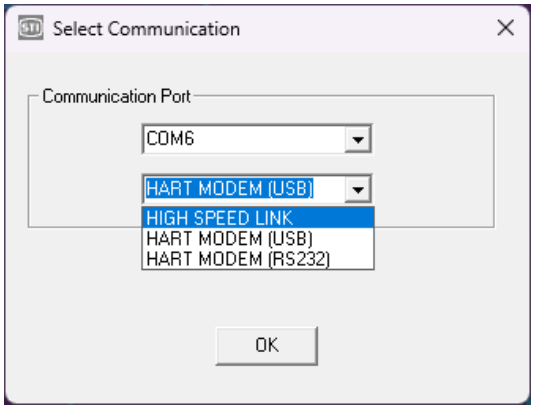
1 DESCRIPTION

The QuickTrak IIIH (Hydraulic) controller can be locally operated by:

- a local device monitor and 4-key keyboard located under the monitor;



- via HART a hand-held terminal;
- by a remote control panel running on a laptop connected to the controller with one of the options listed below:
    - **HIGH SPEED LINK** (RS 232 serial cable)
    - **HART MODEM (USB)**
    - **HART MODEM (RS232)**

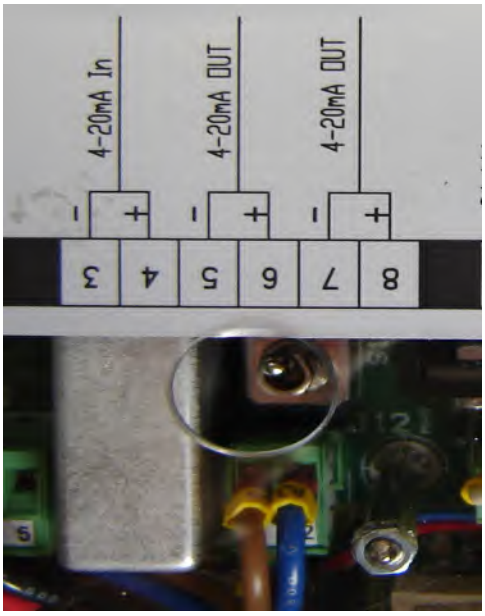


	CAUTION: To prevent any system reaction due to an unauthorized use or accidental contact of the keypad, the system should always be left on the MAIN page. After 5 minutes the system is in stand-by, it returns automatically to the MAIN page.

	WARNING: If communication via the HIGH SPEED LINK (RS-232 serial cable) is required, ensure that the control panel is opened only when the units are in a non-hazardous area.

1.1 CONTROLLER SWITCH ON/OFF

To turn on / off the controller, switch on /off the power switch inside the controller.



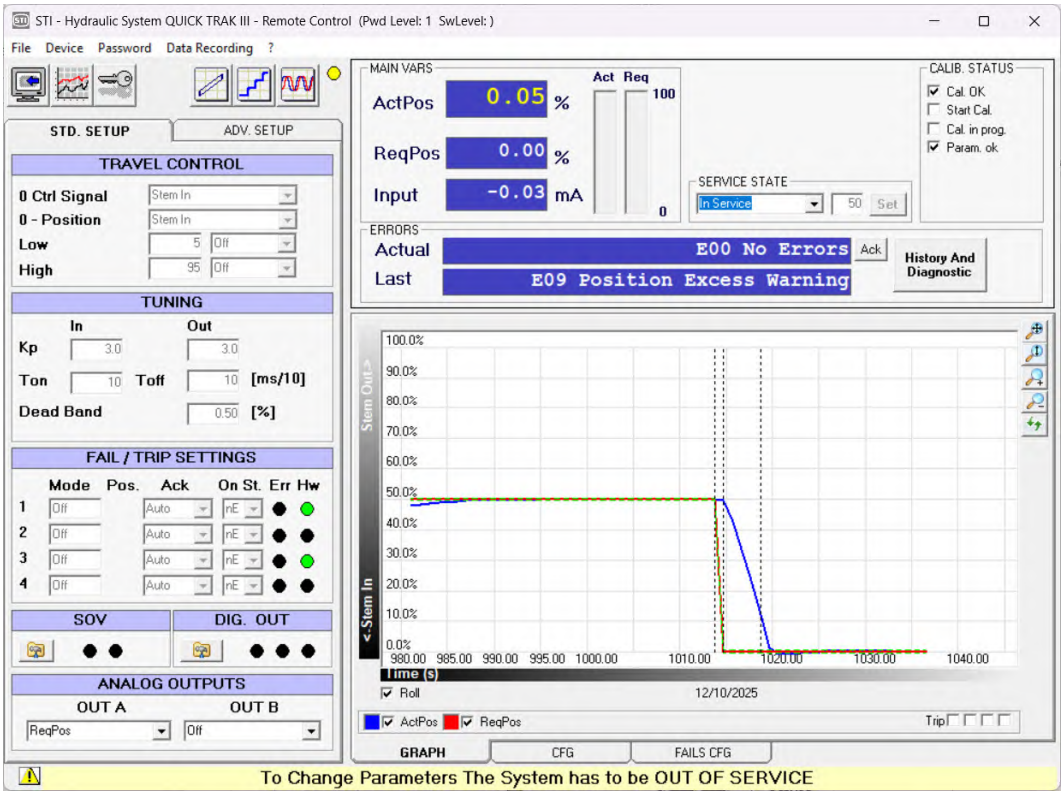
2 SOFTWARE INSTALLATION

2.1 REMOTE CONTROL SOFTWARE

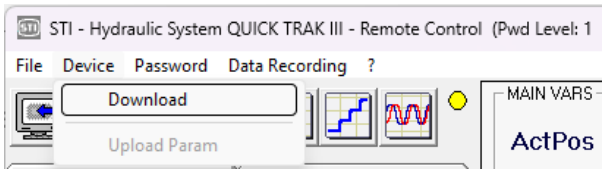
If a remote PC control via RS 232 is required, a management software should be installed on the laptop. The minimum system requirements are: Windows 10.
To install the software:

- make sure that the minimum hardware requirements are met;
- start Windows;
- shut down all running programs;
- launch the installation file: "*SetupQT3_5.27H.exe*";
- follow the instructions;
- insert the password. The standard software manufacturer default password is: **1 2 3 4 5**;
- download the parameters to test the communication.

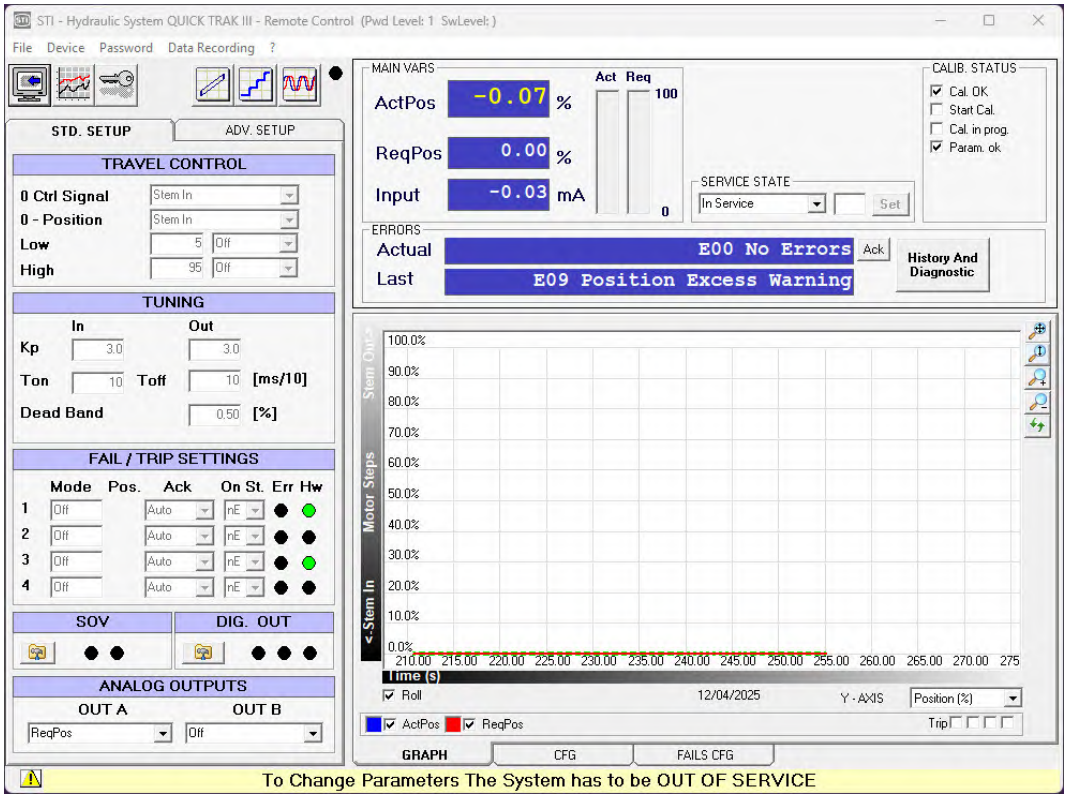
☞	**CAUTION: Do not attempt to operate the process valve in the plant without performing the calibration, as an unpredictable performance may result. A detailed description of the calibration process and the required steps are provided in this manual.**



The parameters download is available in the main command line (pull-down device menu).



At the end of the download phase the configuration parameters fields will be updated.



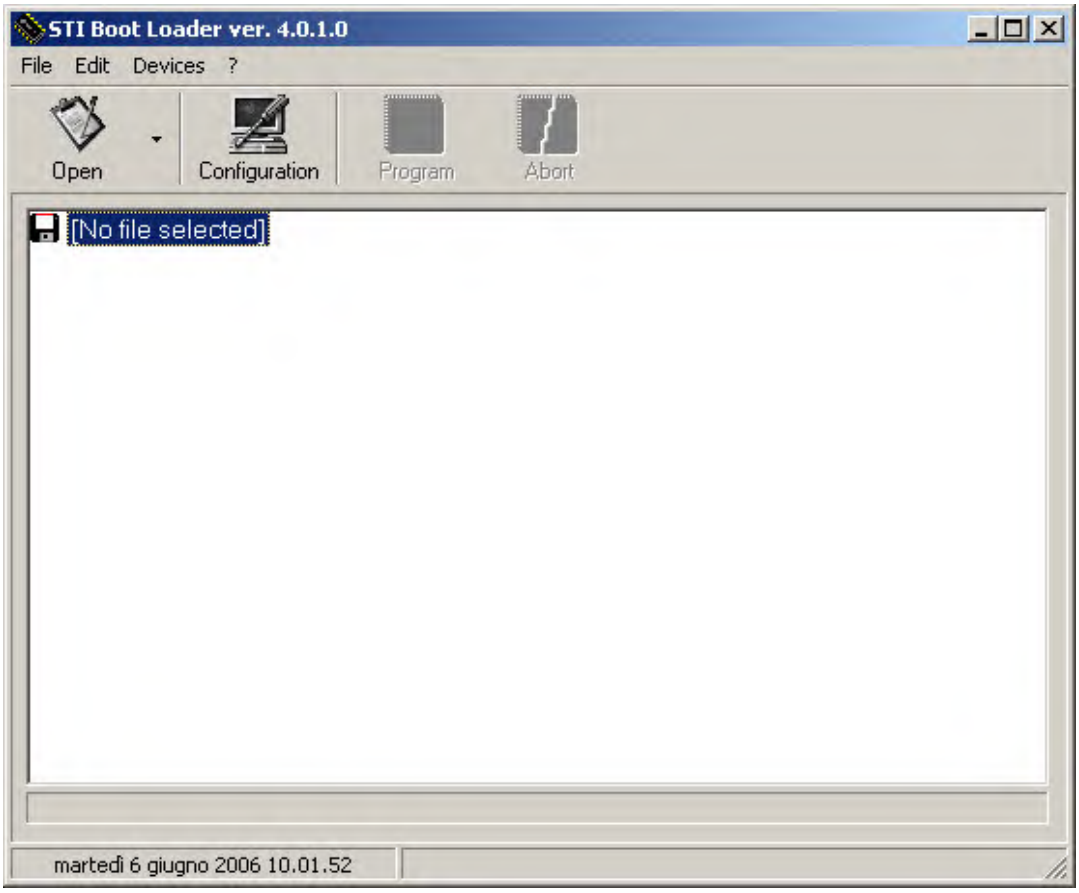
2.2 CONTROLLER SOFTWARE

The two software (DSP and HC12) are factory installed in the controller. For a new installation, a "Loader" program is necessary. It can be installed selecting “SETUP.exe” file from the supplied LOADER software cd. A shortcut should appear in the program selection of start menu. Select the “Loader” access program:

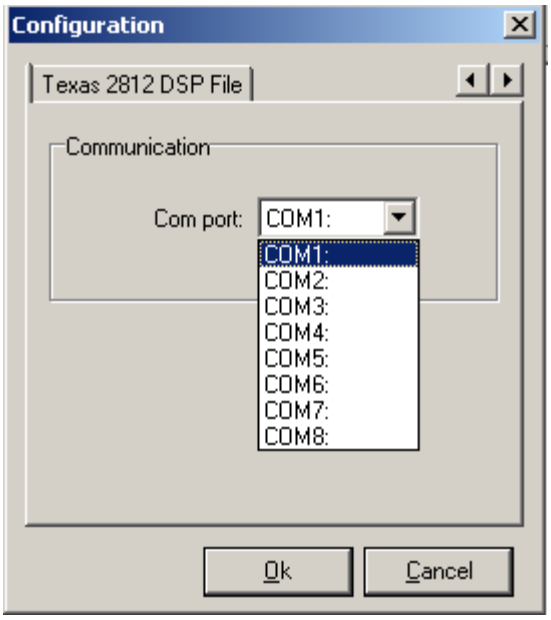
Program » Loader » Loader

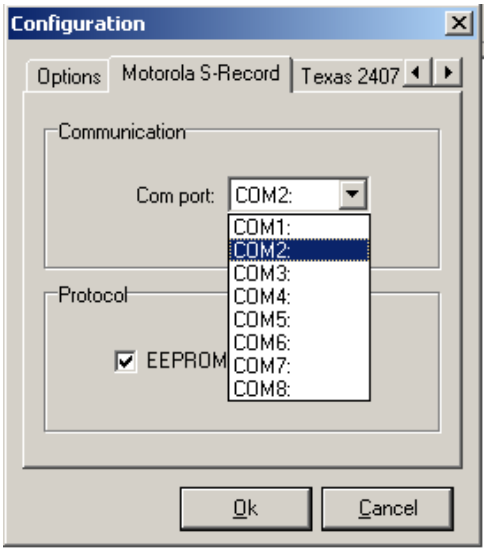
Or select it directly:
C:\Program Files\STI s.r.l\Loader\Loader.exe

The following window will appear:



Configure the PC COM port selecting: “Configuration” from EDIT menu for both Texas (DSP) and Motorola (HC12).



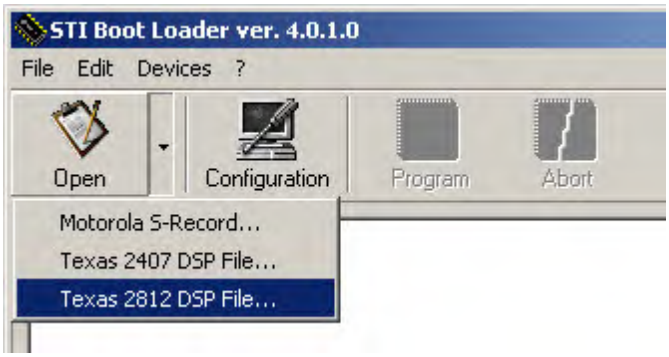


2.2.1 DSP SOFTWARE INSTALLATION

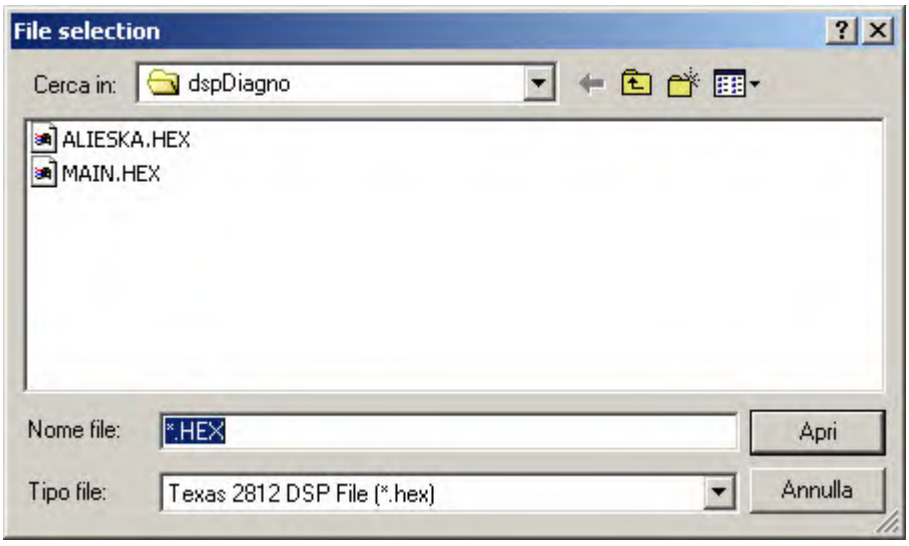
Copy the DSP software to be installed to a folder on the laptop. File extension should be ".hex".
Perform the following steps on the QuickTrak IIIH (Hydraulic) controller to prepare it for software loading.

- Turn off the controller by the main power switch.
- Change the switches SW5 as showed in SW Upgrade mode (see on the board).

- Attach the RS 232 9 pin cable to the J9 connection block (Com DSP).
- Launch the loader program as in §2.2.
- Select the down arrow next to the “OPEN” quick select button.



- Select “Texas DSP File”
- Locate the .HEX file, and select OPEN



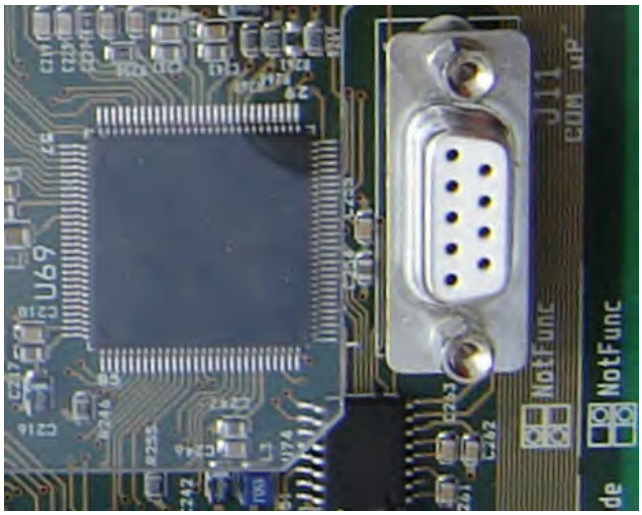
- Turn on the controller
- Select the “Program” quick select button

- The program should run to completion
- Upon completion select File » Exit
- Turn off the controller
- Change the switches SW5 as showed in Normal mode (see on the board).

2.2.2 HC12 SOFTWARE INSTALLATION

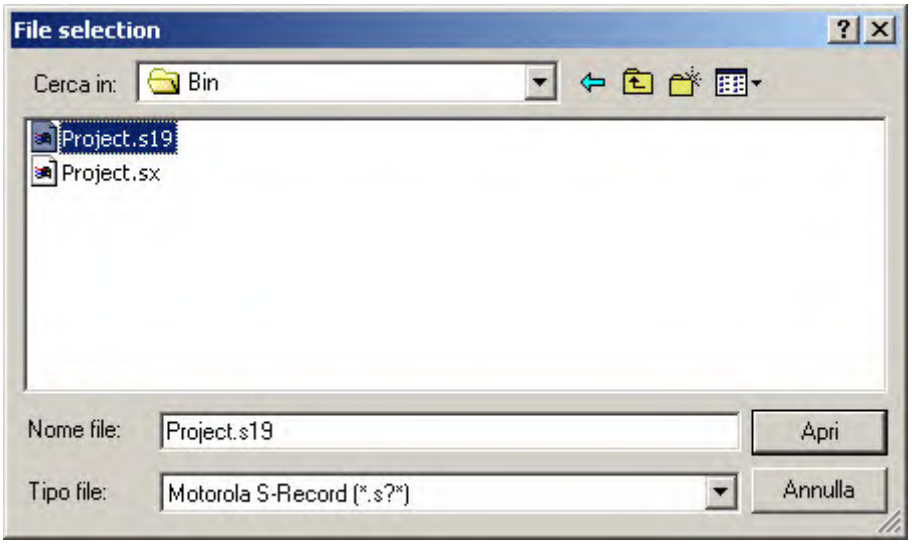
Copy the HC12 software to be installed to a folder on the laptop. File extension should be “.s19”.
Perform the following steps on the QuickTrak IIIH (Hydraulic) controller to prepare it for software loading.

- Turn off the controller by the main power switch.
- Attach the RS 232 9 pin cable to the J11 connection block (COM µP).

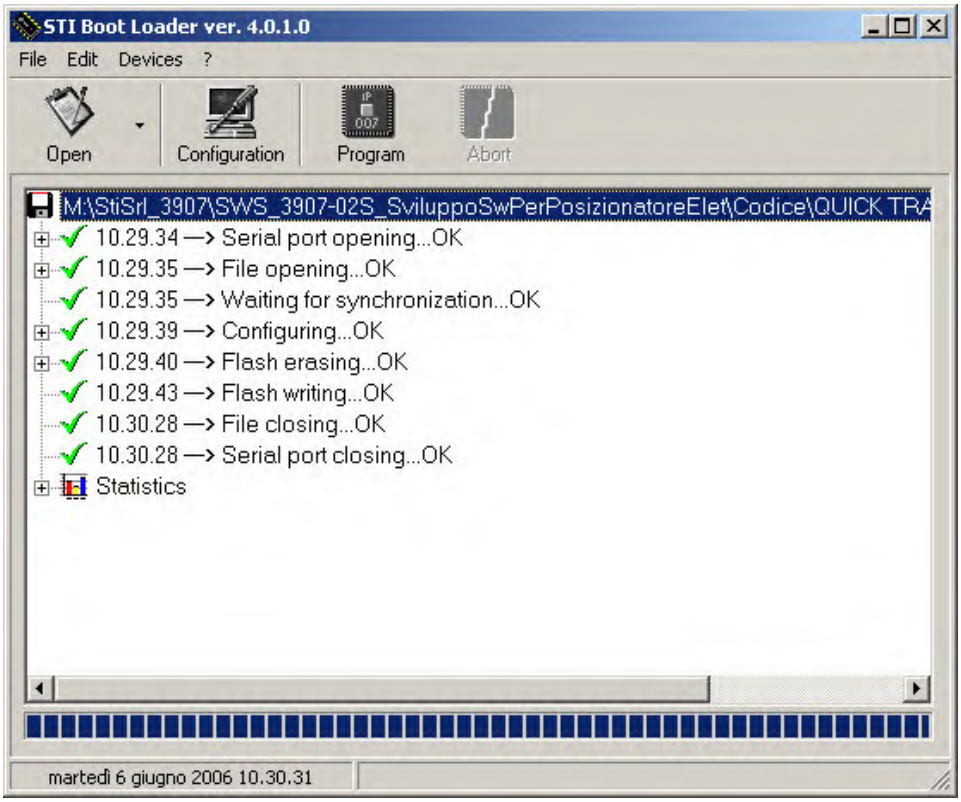


- Launch the loader program.
- Select the down arrow next to the “OPEN” quick select button and choose “Motorola S- Record”.

- Locate the .S19 file and select OPEN.



- Select the “Program” quick select button.
- Turn on the controller.
- The program should run to completion.



- Upon completion select File » Exit.
- Turn off the controller.

3 DESCRIPTION OF THE MENU

IMPORTANT NOTE:

This hydraulic positioner uses the same Local User Interface (LUI) display and menu structure as the pneumatic version.

For clarity and completeness, all menus are shown in this chapter.

However, some menu items are visible on the display but not active or relevant for the hydraulic version. These items apply only to pneumatic positioners and are marked with: (PNEU).

An easy interface for the user is provided for the management and configuration of the system. The interface is composed with the following menu structure: one main menu, many submenus and linked pages.
Please note that some menus and menu items are <u>not relevant</u> for the QTIII Hydraulic.

The structure of the menu is displayed in the following picture:

- **I. MAIN**
- **II. SYSTEM INFO**
- **III. STANDARD SET UP**
  - III.1 TRAVEL CONTROL
  - III.2 TUNING
  - III.3 INPUT CHAR.
  - III.4 INPUTS
  - III.5 OUTPUTS
  - III.6 RESET COMMAND
- **IV. CALIBRATION**
  - IV.1 PROBE CONSTANT
  - IV.2 CALIBRATION
  - IV.3 SYSTEM CALIBRATED
- **V. COMMAND MODE**
  - V.1 SERVICE OUT / IN
  - V.2 MANUAL
- **VI. FAIL & TRIP SETTING**
  - VI.1 SOV CONFIGURATION
  - VI.2 POSITION EXCESS FAIL MODE
  - VI.3 POWER FAIL MODE
  - VI.4 SIGNAL FAIL MODE
  - VI.5 PRESSURE FAIL MODE **(PNEU)**
  - VI.6 MODE FOR TRIP1
  - VI.7 MODE FOR TRIP2
  - VI.8 MODE FOR TRIP3
  - VI.9 MODE FOR TRIP4
- **VII. GENERAL SETTING**
  - VII.1 MEASUREMENT UNITS MET / IMP
  - VII.2 LANGUAGE
  - VII.3 DATE & TIME
  - VII.4 PASSWORD
  - VII.5 CONTRAST
- **VIII. SYSTEM DATA**
  - VIII.1 TE

VIII.2 VI

IX. COMMUNICATION

IX.1 HART PROTOCOL 6.0

X. DIAGNOSTIC

X.1 STROKE KM

X.2 IN SVC HOURS

X.3 MIN TEMP.

X.4 MAX TEMP.

X.5 AVER.TEMP.

X.6 PERM.TIME

X.7 dP UP-DOWN **(PNEU)**

X.8 ERROR STAT

X.9 CALIB STAT

X.10 OUT SVC STAT

X.11 IN SVC STAT

X.12 STAT FREQ

XI. ADVANCED

XI.1 DIAGNOSTIC DATA

XI.2 PROBE TYPE

XI.3 INTEGRAL

XI.4 PROP.GAIN MODE

XI.5 PROP.BAND GAIN

XI.6 PART NUMBER

XI.7 PASSWORD

XI.8 SET AS DEFAULT

XI.9 RESET STAT

XI.10 ERASE CALIB

XI.11 STAT DEBUG

XI.12 HART DEBUG

XI.13 PRESS.CALIB **(PNEU)**

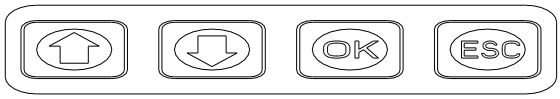
XI.14 MOTOR TEST **(PNEU)**

XI.15 STEP MOTOR **(PNEU)**

XI.16 GEOMETRIC 0

XI.17 SPOOL LIMIT **(PNEU)**

The 4 keys provided (↑, ↓, OK, ESC) for the menus control, have the following function:



Key ↑ allows to shift on the option immediately preceding the one currently selected, enabling the menu shift in the counterclockwise direction up to the reaching of the first option.

Key ↓ allows to shift on the option immediately following the one currently selected, enabling the menu shift in the clockwise direction up to the reaching of the limit given by the last option.

The **OK** key confirms the option currently selected and activates the correspondent operation.

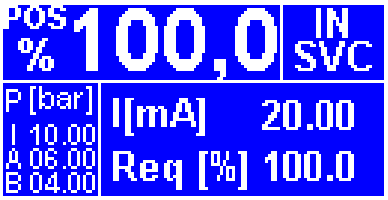
The **ESC** key (when enabled) allows to return to the previous menu.

The enabled keys are shown in reverse to help the operator using the interface, while the disabled keys are not pointed out.

3.1 MAIN

OK			MAIN
	ERR		To display the error page
	ESC		To display the user access page

The main page is displayed after the device start up or by the operator's request.
It has the following format on the controller display:

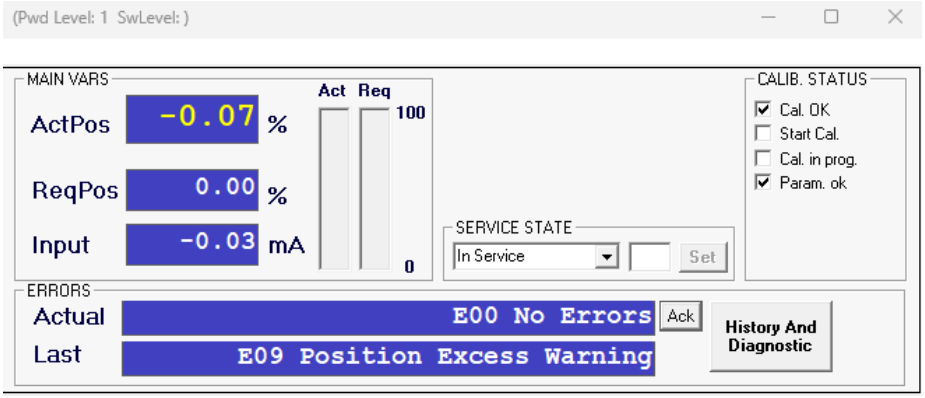


Selecting the MAIN page, the following main system information is displayed on the LCD monitor:

- OUT SVC or IN SVC
  System service state (out of service or in service)
- SUPPLY
  Supply pressure (at the servo valve inlet) **(PNEU)**
- PA
  Pressure in the first chamber (servo valve output port) **(PNEU)**
- PB
  Pressure in the second chamber (servo valve output port) **(PNEU)**
- INPUT
  Inlet signal current [mA]
- REQPOS
  Required Actuator Position [%]
- ACTPOS
  Actuator Position [%]

The active buttons in this page are ERR and ESC; ERR to enter the system error page and ESC to go to the user access page.

If a PC connection is active, on the screen this information is shown in the STATUS window.



3.1.1 ERROR PAGE

OK			MAIN
	ERR		MAIN
		OK	To return to main menu

		ESC	To return to main menu

When ERR button is pushed from the main page the information referred to the present alarm (ERROR CONDITION) and the last detected alarm (LAST ERROR CONDITION) are showed.

ERROR CONDITION: ……..
LAST ERROR CONDITION: ……
PRESS ESC/OK TO EXIT

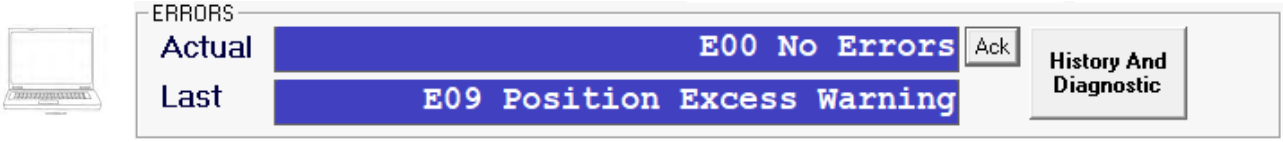
In normal operation condition (no error or fail conditions), the error description showed is NONE.
The errors analyzed by the system are:

0	NONE	There are no active errors
1	TRIP 1	The trip 1 function is active
2	TRIP 2	The trip 2 function is active
3	TRIP 3	The trip 3 function is active
4	TRIP 4	The trip 4 function is active
E05	PRESSURE FAIL **(PNEU)**	Pressure supply is lower than the selected pressure limit
E06	LOW SIGNAL FAIL LIMIT	The inlet signal supply is lower than the selected low signal limit
E07	HIGH SIGNAL FAIL LIMIT	The inlet signal supply is higher than the selected high signal limit
E08	POSITION EXCESS ERROR	The difference between required and actual position, exceeds selected error values
E09	POSITION EXCESS WARNING	The difference between required and actual position, exceeds selected warning values
E10	PROBE ERROR	The probe is not working properly
E11	LOW POWER FAIL	The power is lower than the selected low power limit
E12	HARD LIMITS ERROR	The actuator hard limits have been found invalid during the calibration routine
E13	DSP TIMEOUT	There is no communication between HC12 and DSP cards
E14	WATCH DOG ERROR	The watchdog circuit has detected a malfunction on the DSP card
E15	HIGH POWER FAIL	The power is higher than the selected high power limit
E16	ERROR ON SOLENOID VALVE SOV1	Malfunction detected on SOV1 valve: valve is disconnected, or circuit is interrupted (no current detected in the circuit)
E17	ERROR ON SOLENOID VALVE SOV2	Malfunction detected on SOV2 valve: valve is disconnected, or circuit is interrupted (no current detected in the circuit)
E18	ERROR ON SOLENOID VALVE SOV3	Malfunction detected on SOV3 valve: valve is disconnected, or circuit is interrupted (no current detected in the circuit)
E19	DSP RESTART	The DSP has been improperly restarted
E20	CALIBRATION ERASED	Warning message used in order to inform that a calibration parameters reset has been performed by the operator
E21	EEprom Error 0	Internal error on display electronic board
E22	EEprom Error 1	Internal error on display electronic board
E23	HC12 RESTART	The HC12 has been improperly restarted
E24	EEprom Ext Error 0	Internal error on display electronic board
E25	EEprom Ext Error 1	Internal error on display electronic board

E26	Probe Out of Range	The probe is reading -10% or 110%
E31	CALIBRATION ABORTED	It's a warning message. It informs that calibrations have been aborted due to another error (Pressure, trips, probe..)
E32	ZERO SPOOL ERROR **(PNEU)**	It happens when system cannot find hard limit of the spool
E33	ZERO SPOOL SEARCHING **(PNEU)**	It's a warning message. It informs that the system is searching for the origin
E34	SPOOL LIMIT ERROR **(PNEU)**	The spool hard limits seem not correct (probably due to a friction problem)
E35	FRICTION WARNING **(PNEU)**	The "excess friction warn" message is displayed when 1000 steps are lost on a train of 5000 steps
E36	ENCODER ERROR **(PNEU)**	It happens when more than 300 steps in the same direction without any movement
E37	FRICTION ERROR **(PNEU)**	While an "excess friction fail" message is shown when 4000 steps on a train of 5000 steps are lost
E38	ENCODER INDEX ERROR **(PNEU)**	Encoder index is not found during calibration process.
E39	ENCODER INDEX 2 ERROR **(PNEU)**	Encoder index is not found when the controller is switched on.
E41	WAITING ACK	The system is waiting for the error acknowledgment, performed by the user
E42	EXTERNAL SOV WARNING	Used only in case of trip connected to external SOV (and error mode for trip equal to EXTERN. SOV) Warning message used in order to inform that an external safety shut down valve has been activated
E43	SYSTEM VERSION ERROR	The DSP SW version is not compatible with the HC12 SW version

Press indifferently ESC or OK to return to the main menu.

On the PC screen, that information is shown under the STATUS window.



3.1.2 USER ACCESS PAGE

It's necessary to type the user password to enter into the system from the local panel.

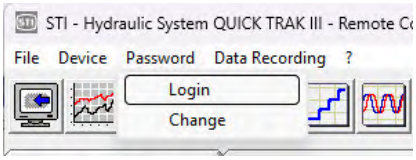
PASSWORD: *****

The device is supplied by the manufacturer with the default password: [OK ↑ ↓ ↑ ↓].

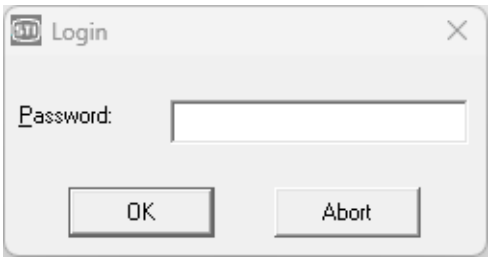
At the end of the login phase, the main menu will appear on the screen:

MAIN
SYSTEM INFO
SYSTEM SET UP
CALIBRATION
COMMAND MODE
FAIL & TRIP SETTING
GENERAL SETTING
SYSTEM DATA
COMMUNICATION
DIAGNOSTIC
ADVANCED

On the PC, a sequence of alfa-numerical digits is required (default is 12345) to access the system in remote mode.
To access to the password request there are two options:



OR



3.2 SYSTEM INFO

↓			**MAIN**
OK			**SYSTEM INFO**
	OK		To return to main menu
	ESC		To return to main menu

In this page the system part number and the software revisions are displayed.

PART NUMBER ……
HC12 SW VERS. ……
DSP SW VERS. ……
PLD VERS. ……..
HART REVISION 6.0
DEV. REVISION ……

The **part number** is the instrument serial number, and it corresponds in the HART Protocol to the Device ID.
The **HC12 µprocessor SW version** is the number corresponding to the SW release currently loaded on the QuickTrak controller.
The **DSP µprocessor SW version** is the number corresponding to the SW release currently loaded on the QuickTrak controller.
The **PLD SW version** is the number corresponding to the SW release currently loaded on the QuickTrak controller.
The **HART Universal Revision Number** is a whole number indicating the HART major revision level supported by the field device.
The **Device Revision Number** defines the revision level of the command set supported by the field Device, including the device-specific commands.

3.3 SYSTEM SET UP

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	ESC		To return to main menu

By a sub-menu contained in this menu level, it's possible to adjust the main positioner functions.

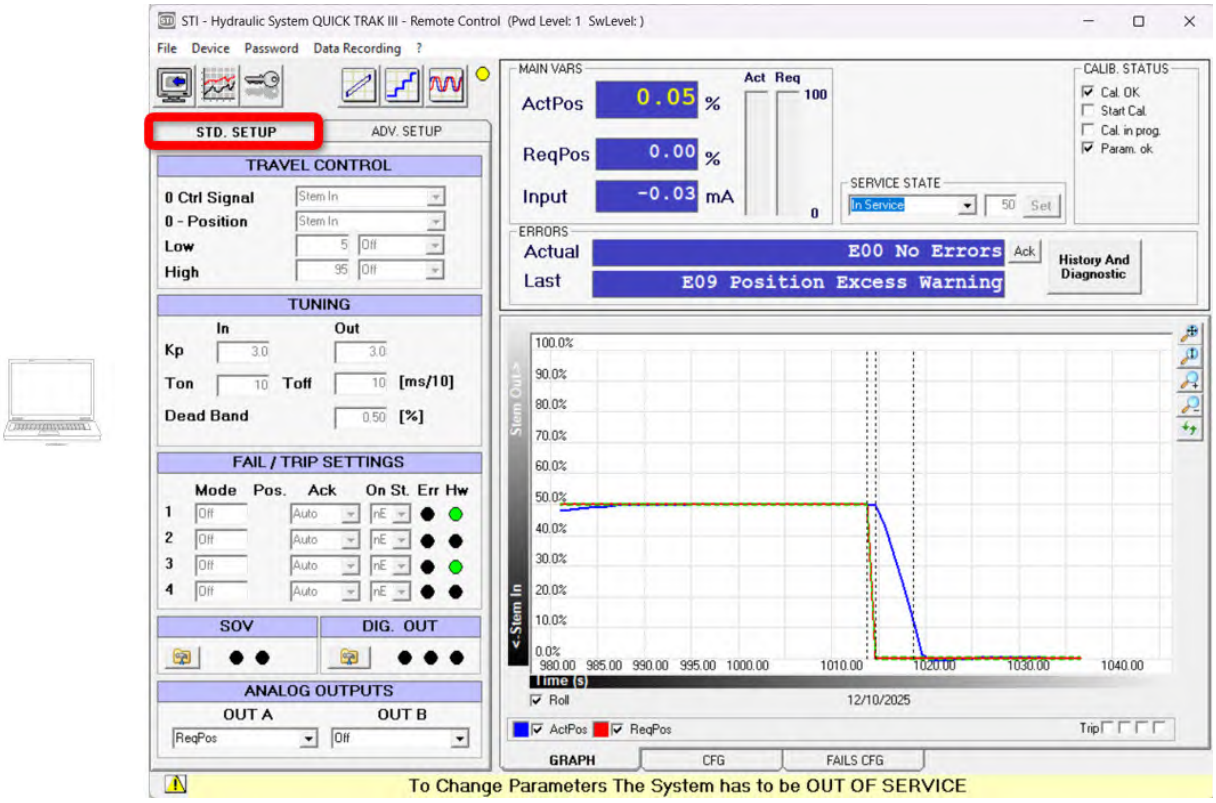
ATTENTION: The system must be put into "out of service" to perform the "set up". Please refer to chapter COMMAND MODE.

CAUTION: When the system is "out of service" any parameters' modifications can cause a movement of the actuator. Before making any changes, make sure that the plant and personnel are in a safe state to allow these movements.

On the LCD monitor, the following menu is displayed:

TRAVEL CONTROL
TUNING
INPUT CHAR.
INPUTS
OUTPUTS
RESET COMMAND

On the PC screen, that information is shown in the "STD. SETUP" (Standard Setup) tab.



3.3.1 TRAVEL CONTROL

↓			MAIN
↓			SYSTEM INFO
OK			SYSTEM SET UP
	OK		TRAVEL CONTROL
		ESC	To return to menu

With this set of commands, it is possible to configure the action of the actuator and special travel functions as limits or cut off functions.

On the LCD monitor, the following menu is displayed:

0 CTRL SIGNAL STEM ↑ / ↓
0 POSITION STEM ↑ / ↓
LTRAVEL POS.
LTRAVEL MODE OFF
HTRAVEL POS.
HTRAVEL MODE OFF

With the keys ↑ / ↓, it is possible to shift on the demanded line, and pushing the OK button, it is possible to change the function. The active selection will come out in reverse. The possible options for the low and high travel control mode are: OFF, LIMIT, CUT OFF.

3.3.1.1 0 CTRL SIGNAL

With this command, it is possible to select the position of the actuator stem corresponding to the 0 signal (4 mA).

KEY ↑ ("Stem in", in the PC software) → Actuator stem retracted at 4 mA
KEY ↓ ("Stem out", in the PC software) → Actuator stem extended at 4 mA

With keys ↑ / ↓, it is possible to shift on the demanded line and pushing the OK button it is possible to change the function. The active selection will come out in reverse.

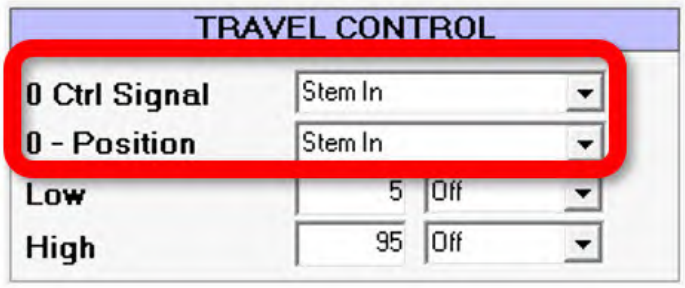
CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

3.3.1.2 0 POSITION

With this command, it is possible to select the position of the actuator stem corresponding to the 0 output signal (0%).

KEY ↑ ("Stem in", in the PC software) → Actuator stem retracted at 0%
KEY ↓ ("Stem out", in the PC software) → Actuator stem extended at 0%

With keys ↑ / ↓, it is possible to shift on the demanded line and pushing the OK button it is possible to change the function. The active selection will come out in reverse.



3.3.1.3 LOW TRAVEL POSITION

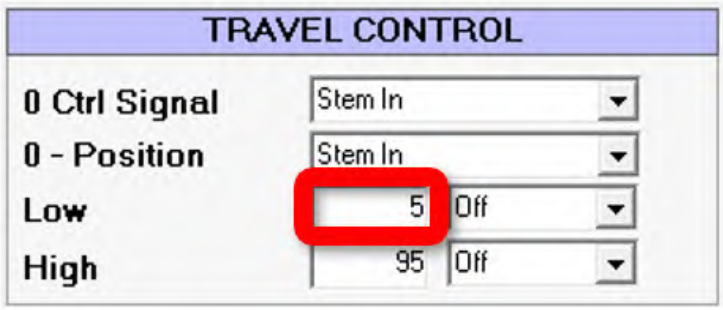
With this command, it is possible to define the low travel position for the actuator. The following information is displayed:

LTRAVEL POS.
5.0 %
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ and subsequently confirmed with OK. Press ESC to return to the previous menu.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC, this function can be activated with the introduction of the value in the cell corresponding to the “low limit”.



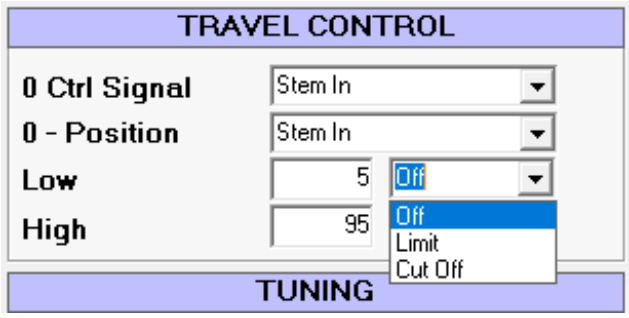
3.3.1.4 LOW TRAVEL MODE

With this command, it is possible to select the low travel control mode (OFF, LIMIT, CUT OFF).
With the keys ↑ / ↓, it is possible to shift on the demanded line and pushing the OK button it is possible to change the function. The active selection will come out in reverse.

Select OFF to disable the travel control function.
Select LIMIT to impose a software travel limit to the lower side of the actuator stroke.
Select CUT OFF to impose a software cut off limit to the lower side of the actuator stroke.
With CUT OFF function the actuator provides full thrust, that is one of the actuator’s chambers is pressurized with max pressure value (air supply pressure) and the other is vented to the atmosphere.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC, this function can be activated with the selection of the option corresponding to the low travel control mode.



3.3.1.5 HIGH TRAVEL POSITION

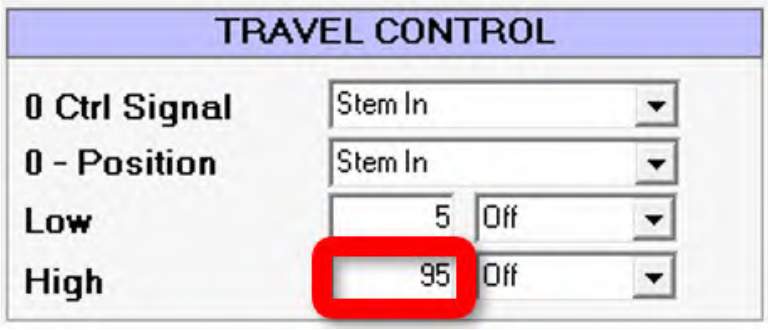
With this command, it is possible to define the high travel position for the actuator. The following information is displayed:

HTRAVEL POS.
95.0 %
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ and subsequently confirmed with OK. Press ESC to return to the previous menu.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC this function can be activated with the introduction of the value in the cell corresponding to the “high limit”.



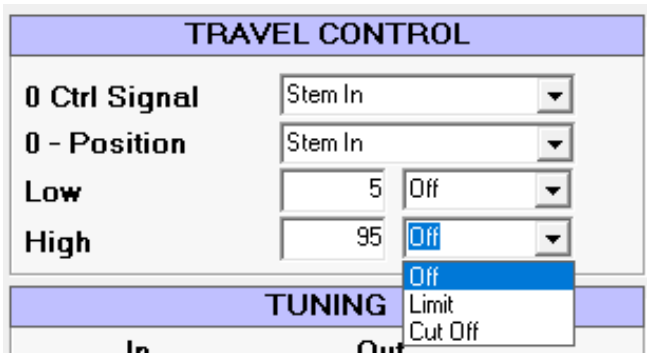
3.3.1.6 HIGH TRAVEL MODE

With this command, it is possible to select the high travel control mode (OFF, LIMIT, CUT OFF).
With the keys ↑ / ↓, it is possible to shift on the demanded line and pushing the OK button it is possible to change the function. The active selection will come out in reverse.

Select OFF to disable the travel control function.
Select LIMIT to impose a software travel limit to the higher side of the actuator stroke.
Select CUT OFF to impose a software cut off limit to the higher side of the actuator stroke.
With CUT OFF function the actuator provides full thrust, that is one of the actuator’s chambers is pressurized with max pressure value (air supply pressure) and the other is vented to the atmosphere.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC, this function can be activated with the selection of the option corresponding to the high travel control mode.



3.3.2 TUNING

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	↓		**TRAVEL CONTROL**
	OK		**TUNING**
		ESC	To return to menu

With this set of commands, it's possible to configure the positioner response parameters such as gain, integral function and dead band.

Selecting this function, the following menu is displayed:

PROPORTIONAL GAIN
DEAD BAND

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

3.3.2.1 PROPORTIONAL GAIN

With this command, it is possible to enter a sub-menu:

PROP.GAIN STEM ↓ 3.0
PROP.GAIN STEM ↑ 3.0

Proportional gain is the multiplier of the error (difference between input signal and actuator actual position) and it is expressed in percent. It is active only for an error which is bigger than dead band value.
A different gain for each stem direction can be imposed.

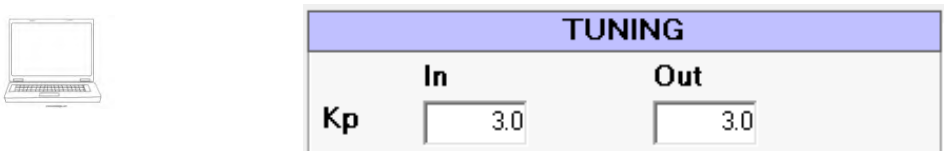
With the OK command selection, it is possible to enter the parameter change page for the selected line (actuator stem direction) and modify the displayed value:

PROP.GAIN STEM ↓ (or STEM ↑)
3.0
PRESS OK TO CONFIRM

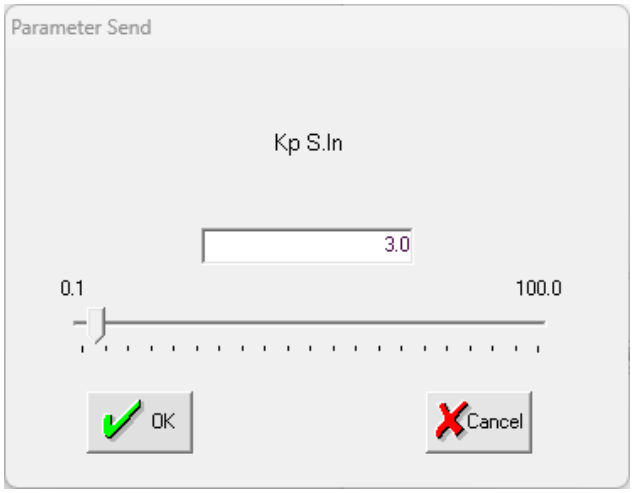
The second line value can be changed by pressing the key ↑ / ↓ and subsequently confirmed with OK. Press ESC to return to the previous menu.

WARNING: A wrong proportional gain value can generate actuator instability.

On the PC software, this parameter is called “Kp”, and two cells are available (one for each direction) in “double” gain mode.



To set the value, double click on the selected cell and, the following window will appear:



Insert the value and press “SEND” to confirm it or “Cancel” to exit.

WARNING: A wrong proportional gain value can generate actuator instability.

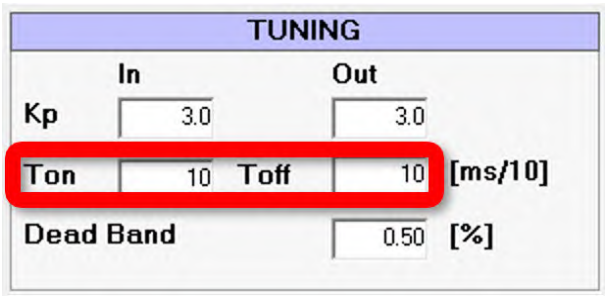
3.3.2.2 Ton and Toff times

With this command, it is possible to modify pulse duration parameters “Ton” and “Toff”.

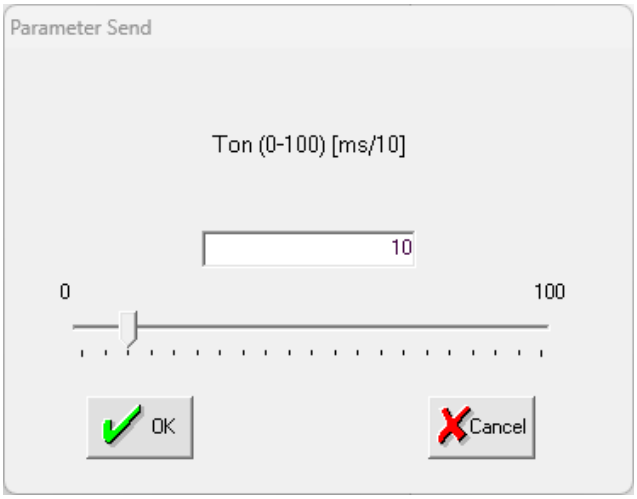
The positioner controls the solenoid valves (SOV 1 and SOV2) by repeatedly turning them ON and OFF instead of keeping them fully energized. This helps to fine-tune the actuator’s position smoothly as it approaches the setpoint.

- Ton (ON Time):
  This is the minimum amount of time (in milliseconds/10) that the SOV stays energized (ON).
  - Longer Ton → Valve stays open longer → More fluid flow → Faster actuator movement
  - Shorter Ton → Less fluid flow → Slower movement.
- Toff (OFF Time):
  This is the amount of time (in milliseconds/10) that the SOV stays de-energized (OFF) after being energized.
  - Longer Toff → Valve stays closed longer → Less fluid flow → Slower movement.
  - Shorter Toff → More frequent openings → Faster movement.

On the PC software, those values are in the TUNING window, and they can be set in the range 0÷100 in (ms/10).



To set the value, double click on the selected cell and the following window will appear:



Insert the value and press “SEND” to confirm or “Cancel” to exit.

	CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

3.3.2.3 DEAD BAND

With this command, it is possible to modify the dead band value. Dead band prevents (at expense of the accuracy) that the valve, in the controlled condition, keeps continuously hunting for the target position.

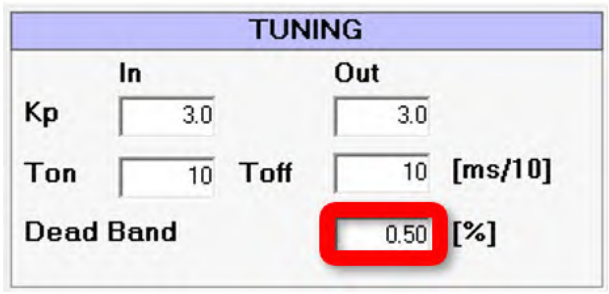
DEAD BAND
0.50
PRESS OK TO CONFIRM

It is expressed in terms of a total stroke percentage in a range of 0.05%÷20%.

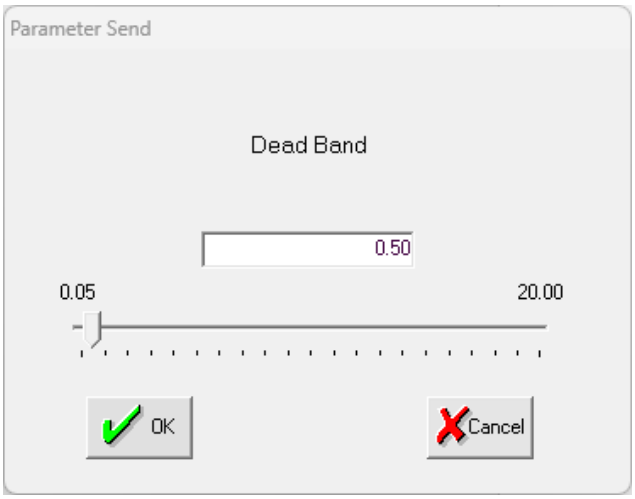
	WARNING: A wrong dead band value can generate actuator instability.

	CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

On the PC software, a single cell is available to modify the dead band value.



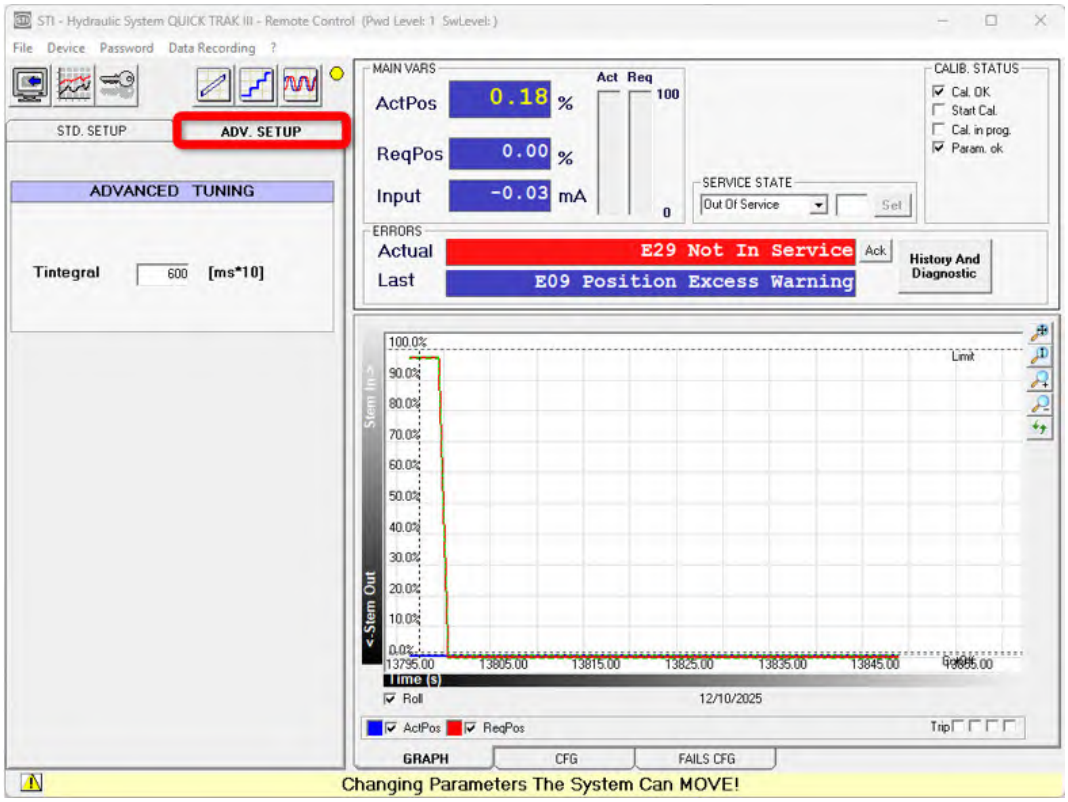
To set the value, double click on the cell, the following window will appear:



Insert the value and press “SEND” to confirm or “Cancel” to exit.

3.3.3 ADVANCED TUNING

On the PC screen, that information is shown in the “ADV. SETUP” (Advanced Setup) tab.

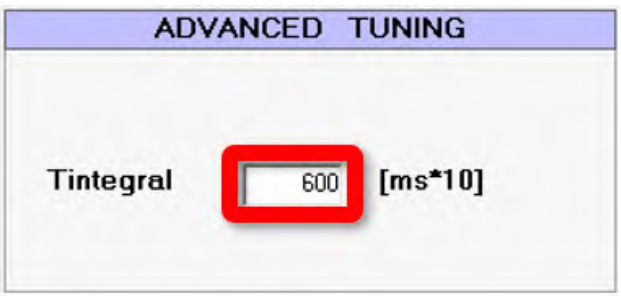


3.3.3.1 Tintegral Factor

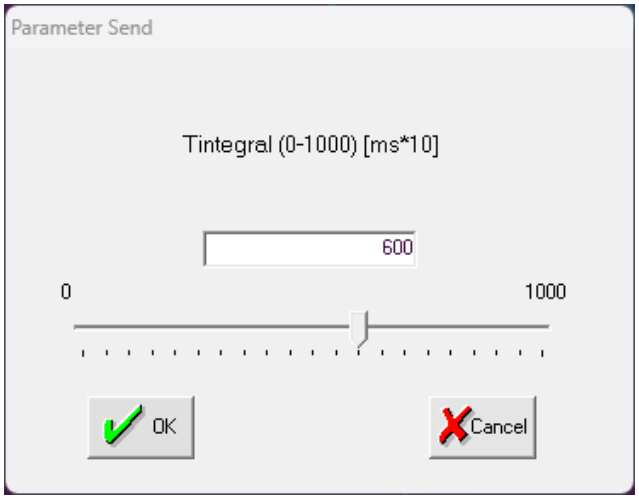
Tintegral factor (in milliseconds * 10) is the parameter that determines how the accumulated error over time influences the positioner control action. It acts by integrating the error signal, gradually correcting any persistent offset between the input signal and the actual position.

The Tintegral action becomes effective only when the error exceeds the dead band value and the actuator is not moving.

The Tintegral setting for each stem direction is the same. It can only be configured using the PC software in the ADVANCED TUNING panel, and it can be set in the range 0÷1000 in (ms*10).



To set the value, double click on the selected cell and, the following window will appear:



Insert the value and press “OK” to confirm it or “Cancel” to exit.

	WARNING: An incorrect integral factor can lead to slow response or oscillations due to excessive accumulation of error.

3.3.4 INPUT CHARATERISTIC

↓			MAIN
↓			SYSTEM INFO
OK			SYSTEM SET UP
	↓		TRAVEL CONTROL
	↓		TUNING
	OK		INPUT CHAR.
		ESC	To return to menu

With those commands, it is possible to configure the relationship between the input signal and valve position set.

Selecting this function on the display, the following menu appears:

POSITION MODE LINEAR (or CUSTOMER)
CUSTOMER TABLE

In the first line, it's possible to move from linear to customer options (and vice versa) with the OK command. On the second line, with OK selection, it's possible to enter the changing point values page of the customer curve.

TABLE	**01**/03
SET POINT	TRAV.TARGET
0.0	**0.0**
10.0	**10.0**
20.0	**20.0**
30.0	**30.0**

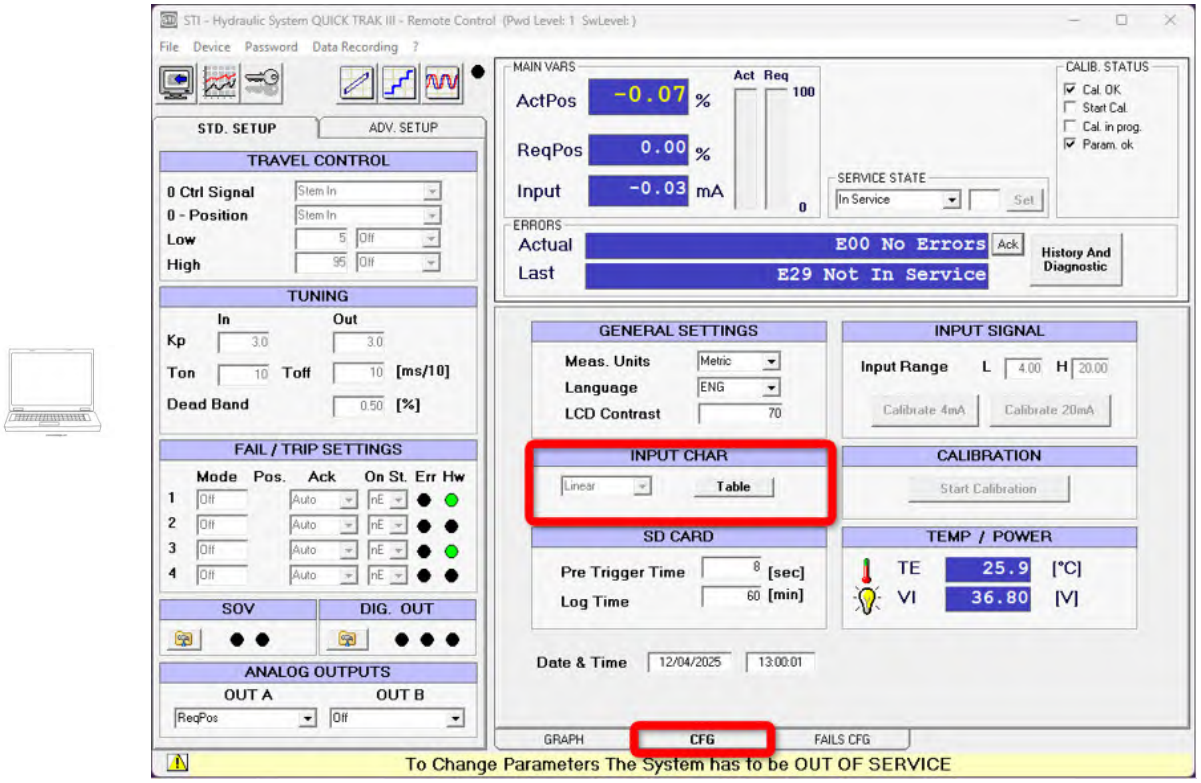
In the first line, the current page is indicated, in the second line there are the column titles. In the following lines, there are: the position and the corresponding parameter values.
The active field will come out in reverse. With the OK selection, it's possible to change the active data field. With the ↑ / ↓ commands, it's possible to modify all the available parameters.
Changing the page number, it's possible to scroll the customer table.

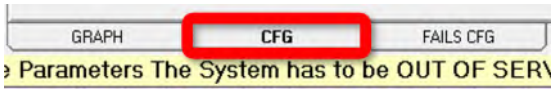
TABLE	**02**/03
SET POINT	TRAV.TARGET
40.0	**40.0**
50.0	**50.0**
60.0	**60.0**
70.0	**70.0**

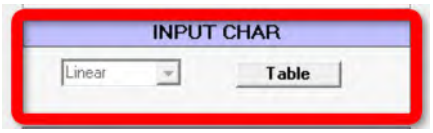
TABLE	**03**/03
SET POINT	TRAV.TARGET
80.0	**80.0**
90.0	**90.0**
100.0	**100.0**

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

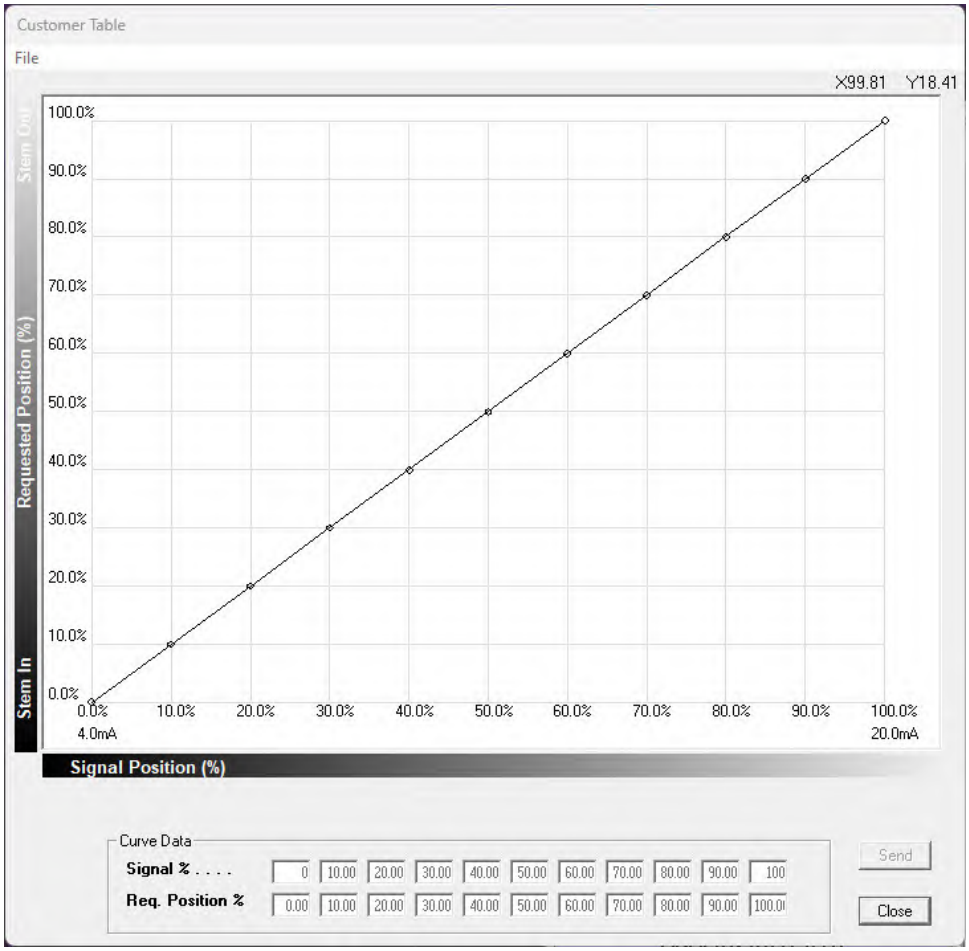
On the PC software is possible to select the curve type form the “INPUT CHAR” window that is located in “**CFG**” label:



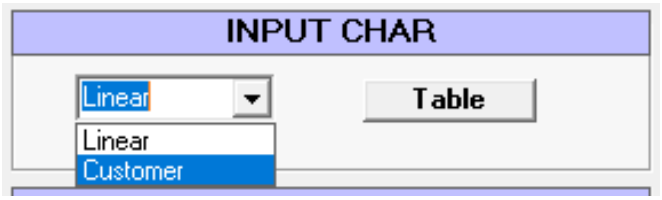




In case of “Customer Curve” selection, pushing the “Table” button, it’s possible to display the entire curve. From this page, it’s possible to modify the point values inserting the value into the cell or trailing the point position on the graph with the mouse.



Press “SEND” to confirm the values or “CLOSE” to exit from this window. In order to use the transfer curve modified remember to select “Customer” instead “Linear” in INPUT CHAR window.



3.3.5 INPUTS

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	↓		**TRAVEL CONTROL**
	↓		**TUNING**
	↓		**INPUT CHAR.**
	OK		**INPUTS**
		ESC	To return to menu

With this set of commands, it’s possible to configure the zero inlet signal and span.

Selecting this function, the following menu appears on the display:

INPUT RANGE L XX.XmA
INPUT RANGE H XX.XmA
CALIBRATE 4.0mA
CALIBRATE 20.0mA

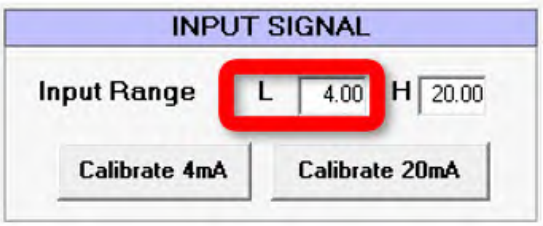
3.3.5.1 INPUT RANGE LOW

With this command, it's possible to set the lower range limit for the input signal.

INPUT RANGE LOW
4.0 mA
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ in a range between 0.0÷10.0 mA and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC software, it's possible to insert the required value into the "Input Range L" cell in the INPUTS window.



To set the value, double click on the selected cell and press "SEND" to confirm or "ABORT" to exit from this window.

CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

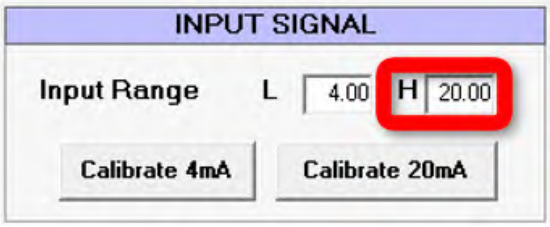
3.3.5.2 INPUT RANGE HIGH

With this command, it's possible to set the upper range limit for the input signal.

INPUT RANGE HIGH
20.0 mA
PRESS OK TO CONFIRM

The second line value can be changed by pressing the key ↑ / ↓ in a range of between 10.0÷30.0 mA and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC software, it is possible to insert the required value into the “Input Range H” cell in the INPUTS window.



To set the value, double click on the selected cell and press “SEND” to confirm or “ABORT” to exit from this window.

	CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

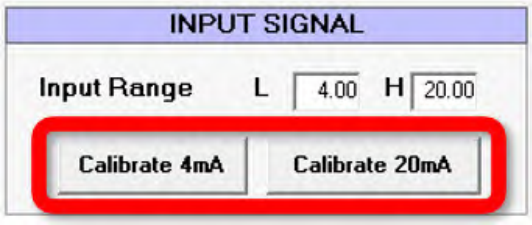
3.3.5.3 CALIBRATE 4 mA or 20 mA

With this command, it’s possible to calibrate the 4mA (or 20 mA) to set the input signal.
A confirmation is required to start the 4mA/20mA calibration routine:

CALIBRATE 4.0mA? or CALIBRATE 20.0mA?

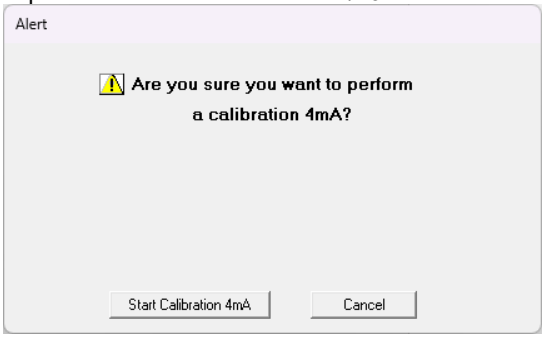
PRESS OK TO CONFIRM

On the PC software, is possible calibrate the two points by pushing the “Calibrate 4mA” and “Calibrate 20mA” buttons.



	CAUTION: Modifying this parameter, the actuator can move. Before changing, make sure that the plant and personnel are in a safe state to allow these movements.

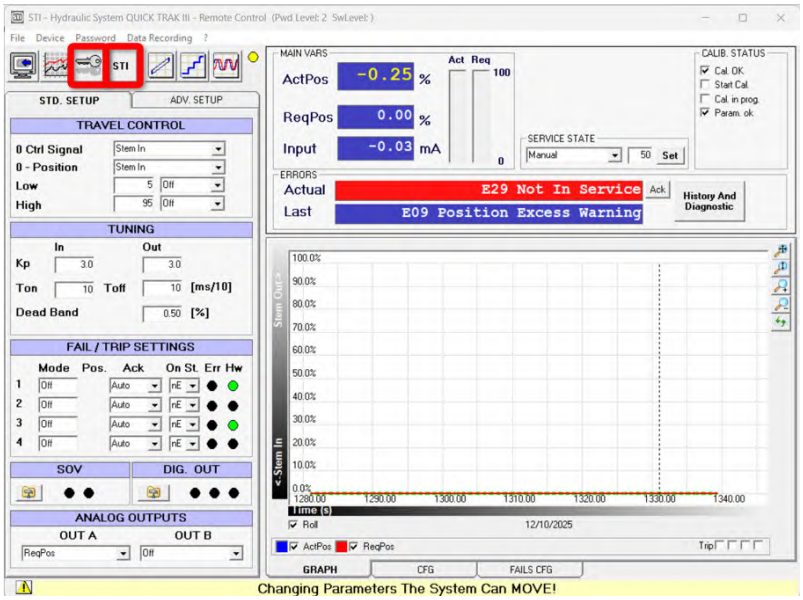
A confirmation is required in order to start the 4ma/20mA calibration routine:



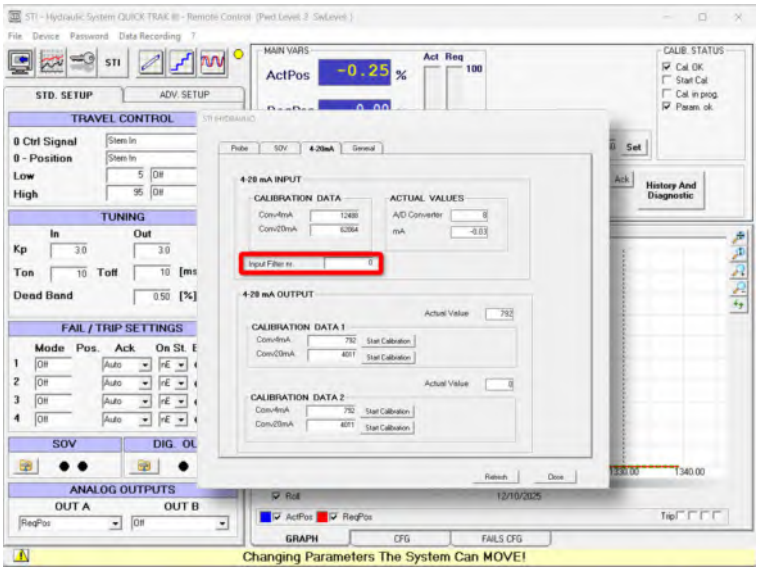
3.3.5.4 SETPOINT INPUT FILTER CONFIGURATION

This feature allows to configure the input filter applied on the setpoint signal.
Usually, the QuickTrak is used in very fast application but sometimes it is necessary to apply a filter on the setpoint to avoid following the noise coupled on the signal or coming from the process sensors.

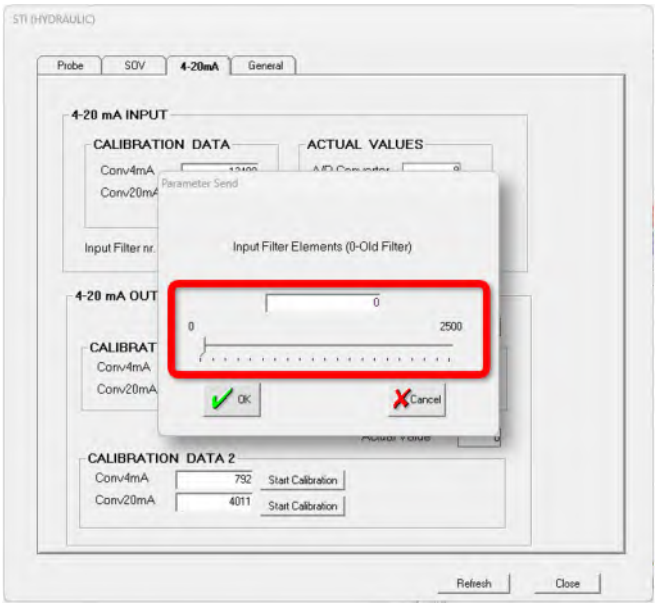
On the PC software is possible to modify the filter setpoint.
Press the key and put the second level password.



The parameter “INPUT FILTER NR” in the advanced STI panel can assume the values:
0 = old style filter (like in the previous sw releases)
1.2500 = simplified moving average filter



Press two times quickly “Input Filter nr.”:



Set the parameter by the sliding arrow.
When a number between 1 and 2500 is specified a moving average filter (sampling time 1ms, length of the moving average equal to the configured value) is used.
A low value meand a low filter effect, a big value means a strong filtering.

3.3.6 OUTPUTS

↓			**MAIN**
↓			**SYSTEM INFO**
OK			**SYSTEM SET UP**
	↓		**TRAVEL CONTROL**
	↓		**TUNING**
	↓		**INPUT CHAR.**
	↓		**INPUTS**
	OK		**OUTPUTS**
		ESC	To return to menu

With this set of commands, it’s possible to configure the available output channels.

Selecting this function on the display, the following menu appears:

ANALOG OUTPUT A
ANALOG OUTPUT B
DIGITAL OUTPUT1
DIGITAL OUTPUT2
DIGITAL OUTPUT3

3.3.6.1 ANALOG OUTPUT

When ANALOG OUTPUTs (A or B) are selected with the OK key, it’s possible to enter the available analog output parameters page:

REQPOS	OFF/ON (required position, between 4÷20 mA)
ACTPOS	OFF/ON (actuator position, between 4÷20 mA)
INPUT	OFF/ON (input signal, between 4÷20 mA)

It's possible to choose the required parameter, to associate it to the selected output channel for the reproduction of the indicated signal in a range from 4mA to 20mA. Pressing OK to confirm the choice, the ON indication will be pointed out on the selected channel. Press ESC to return to the previous menu.

On the PC software, it's possible to impose the output parameter by its selection in correspondence of OUT A or OUT B.

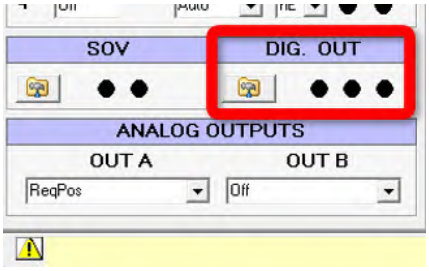
3.3.6.2 DIGITAL OUTPUT

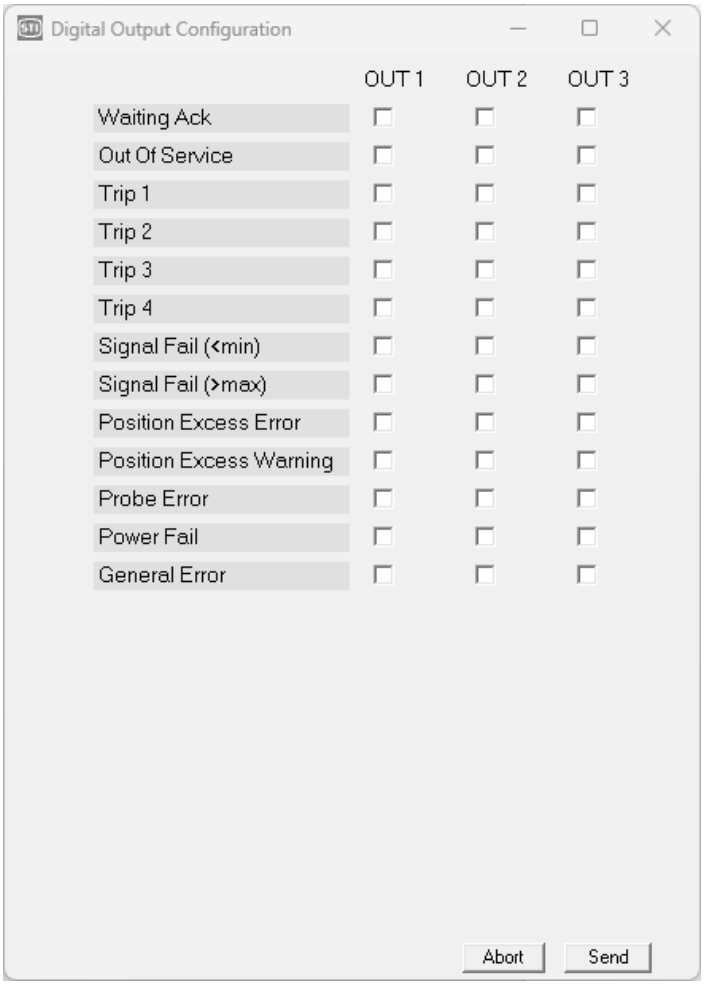
When DIGITAL OUTPUTs (1,2 or 3) are selected with the OK key, it's possible to enter the available digital output parameters page:

WAITING ACK		OFF/ON	
OUT SVC		OFF/ON	
TRIP 1		OFF/ON	
TRIP 2		OFF/ON	
TRIP 3		OFF/ON	
TRIP 4		OFF/ON	
PRESSURE FAIL	LOW	OFF/ON	**(PNEU)**
SIGN.FAIL		OFF/ON	
HIGH SIGN.FAIL		OFF/ON	
POS.EXC. ERROR		OFF/ON	
POS.EXC. WARN.		OFF/ON	
PROBE ERROR		OFF/ON	
POWER FAIL		OFF/ON	
HARDWARE ERROR		OFF/ON	**(PNEU)**
ENCODER ERROR		OFF/ON	**(PNEU)**
EXC.FRICT.ERR.		OFF/ON	**(PNEU)**
ENC. INDEX ERR.		OFF/ON	**(PNEU)**

It's possible to choose the required failure, warning or error activation, to associate it to the selected digital output channel. Pressing OK to confirm the choice, the ON indication will be pointed out on the selected channel. Press ESC to return to the previous menu.

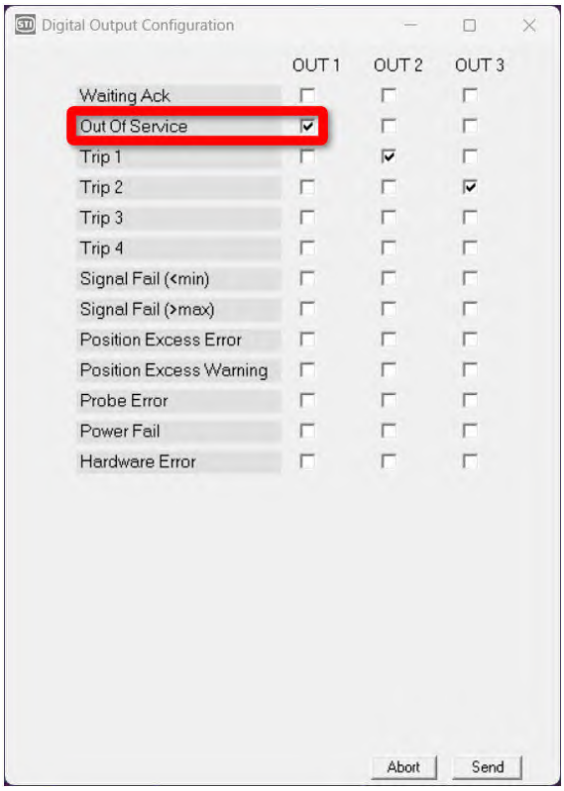
On the PC software, pushing the Dig. Out Config. button located in the DIG. OUT window, it's possible to impose the output parameter by its selection in correspondence of OUT 1, OUT 2 or OUT 3.

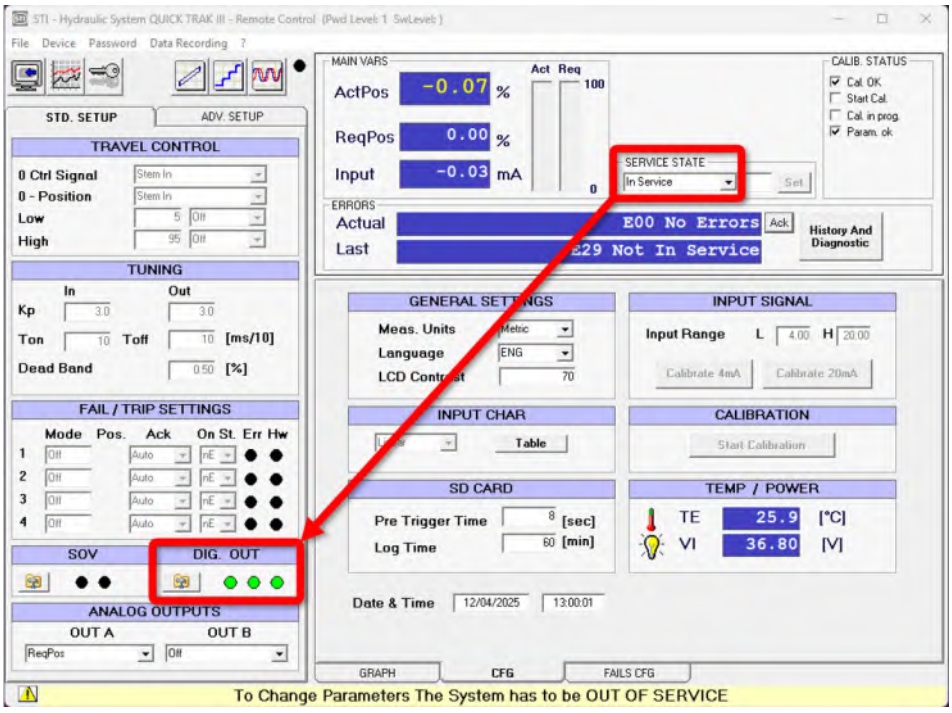


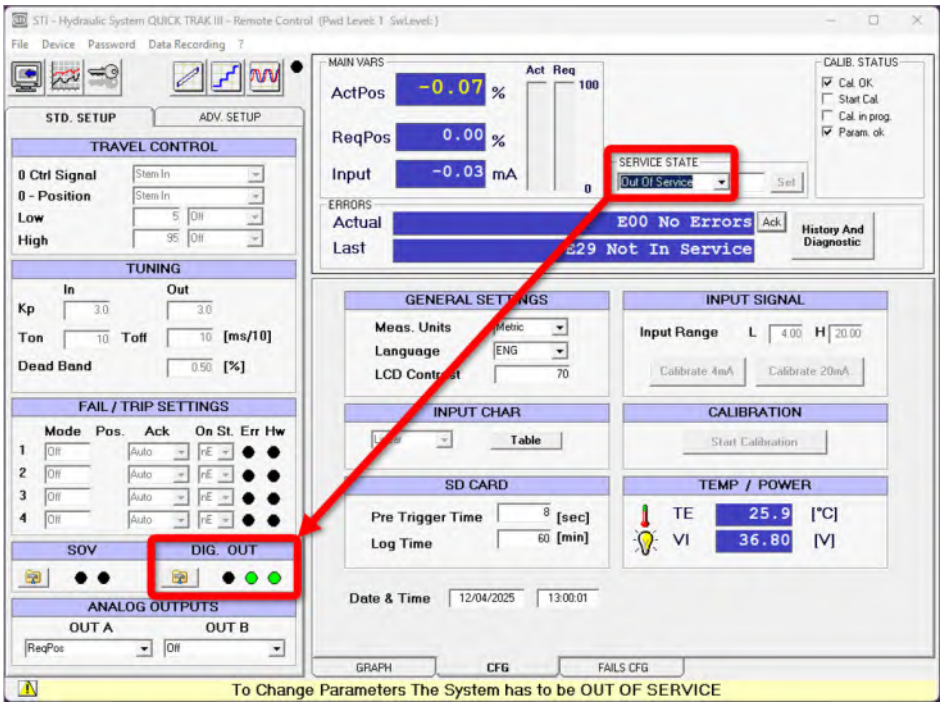


The status of OUT 1, OUT 2 and OUT 3 is shown in DIG OUT window. When a function is selected, the related output is deactivated when the event is true.

For example: Dig OUT1 is set on “Out of service”. When the service state is “In Service” the digital output 1 is activated, when the service state pass in “Out of service” the digital output 1 is turned off.






STI - Hydraulic System QUICK TRAK III - Remote Control
File Device Password Data Recording ?
STD. SETUP
ADV. SETUP
TRAVEL CONTROL
0 Ctrl Signal
0 - Position
Low
High
TUNING
In
Out
Kp
Ton
Toff
[ms/10]
Dead Band
[%]
FAIL / TRIP SETTINGS
Mode Pos. Ack On St. Err Hw
SOV
DIG. OUT
ANALOG OUTPUTS
OUT A
OUT B
MAIN VARS
ActPos -0.07 %
ReqPos 0.00 %
Input -0.03 mA
Act Req
SERVICE STATE
Out Of Service
Set
ERRORS
Actual E00 No Errors
Ack
Last E29 Not In Service
History And Diagnostic
CALIB. STATUS
Cal. OK
Start Cal.
Cal. in prog.
Param. ok
GENERAL SETTINGS
Meas. Units
Language
LCD Contrast
INPUT SIGNAL
Input Range L H
Calibrate 4mA
Calibrate 20mA
INPUT CHAR
Table
CALIBRATION
Start Calibration
SD CARD
Pre Trigger Time [sec]
Log Time [min]
TEMP / POWER
TE 25.9 [°C]
VI 36.80 [V]
Date & Time 12/04/2025 13:00:01
GRAPH
CFG
FAILS CFG
To Change Parameters The System has to be OUT OF SERVICE

3.4 CALIBRATION

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
OK			**CALIBRATION**
	ESC		To return to main menu

With this selection is possible to activate the instrument calibration routine.

☞	**Before to perform a calibration, it's suggested to *set to 1,0* the values of *Kp stem in and Kp stem out*.**

If the customer tries to make a calibration when the system is "in service", the following message will be shown:

REFUSED REQUEST:
SVCSTATE MUST BE OUT!
PRESS ESC/OK TO EXIT

First step of the calibration is the setting (by means of ↑ / ↓ buttons) of the probe constant. This value is printed on the probe label.

PROBE CONSTANT
2800
PRESS OK TO CONFIRM

☞	**CAUTION: While the system is in calibration mode, the controller will move the cylinder (and process valve) automatically through various positions regardless of the state of the normal input command, including the fully open and fully close position. Before calibrating the system, make sure that the plant and personnel are in a safe state to allow these automatic functions.**

Second step is the calibration confirmation:

CALIBRATION ?

PRESS OK TO CONFIRM

Once the calibration operation is confirmed with OK, the following page will be displayed on video:

SYSTEM CALIBRATION…….

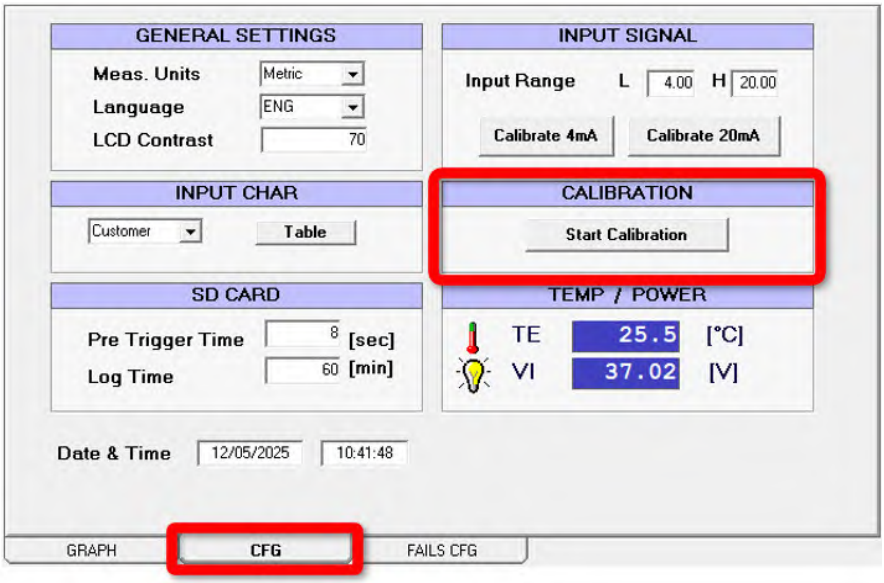
PLEASE WAIT

And it will remain active during the execution of calibration routine.
Once the operation is completed the following message is shown.

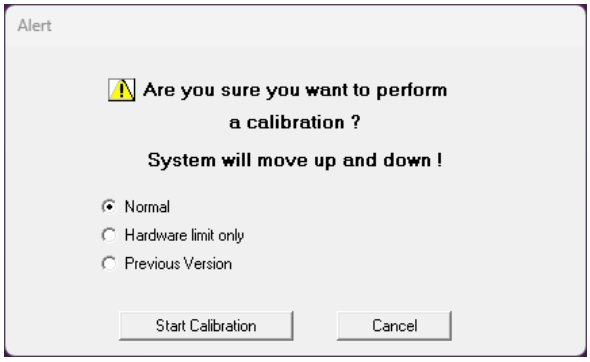
SYSTEM CALIBRATED
PRESS ESC TO MENU
PRESS OK TO GO IN SVC

Pressing OK, the system enters the in service state automatically.
Pressing ESC the main menu will be displayed.

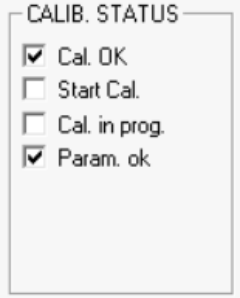
On the PC software, it is possible to start calibration selecting the “start calibration” button located in CFG tag.



A confirmation is required in order to start the calibration routine:



Calibration status is shown on the upper side on the right of the panel:

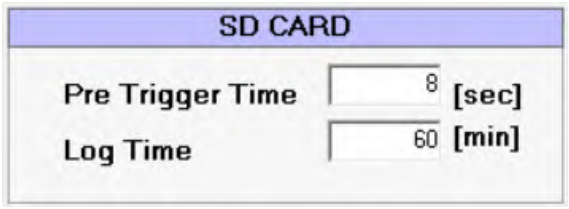


3.5 SD CARD

Inserting a SD card into the slot on the display board an automatic process of data collection is activated.
Automatically will be created a folder for each month and year named DIAGyymm (yy: year mm: month). And will be stored 2 kinds of files:

- **History file:** stores parameters periodically and the time between a file and the other is set in LOG TIME
- **Event file:** store parameters on event. The event that causes the storing of the file are:
  - Signal < min
  - Signal > max
  - Position error
  - Position warning
  - Probe error
  - Trips

The event file is a snapshot of 20 sec. (100 Hz sampling rate frequency) triggered on event with the pre-trigger time set by user.
It is possible to configure the storing parameters in SD CARD area in CFG tag.



The SD Card must be formatted in FAT 16 (up to 2GB capacity).

3.6 COMMAND MODE

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
OK			**COMMAND MODE**
	ESC		To return to main menu

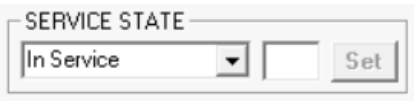
With this selection, it is possible to change the system service status.

The local control panel displays:

SERVICE OUT / IN
MANUAL

In the first line the active option is displayed in reverse.

On the PC screen, that information is shown in the SERVICE STATE window:



3.6.1 SERVICE OUT / IN

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
OK			**COMMAND MODE**
	OK		**SERVICE OUT/IN**
		ESC	To return to menu

When a different option is selected, a confirmation is required to change the system service status.

If the system is out of service, the OUT option is displayed in reverse and the IN selection is made pressing OK.
The following message appears:

SERVICE STATE:
OUT SVC -> IN SVC
PRESS OK TO CONFIRM

The OK selection is required to confirm the option.
To go back to out of service state, the following confirmation message is displayed:

SERVICE STATE:
IN SVC -> OUT SVC
PRESS OK TO CONFIRM

To go in service state, the system must be calibrated, if this condition is not satisfied, the error message is

displayed:

REFUSED REQUEST:
INVALID SYSTEM STATE!
PRESS ESC/OK TO EXIT

On the PC, it is possible to choose the service state, selecting the service status on the pull-down menu in the command mode cell.

CAUTION The plant operator has the responsibility to make sure that automatic cycling of the process valve, will not cause any damage to property or personnel before issuing the "in service" command. This includes making sure that personnel and equipment are clear of moving parts of the cylinder and process valve and that the plant process has been made safe by bypassing the process valve.

3.6.2 MANUAL

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
OK			**COMMAND MODE**
	↓		**SERVICE OUT/IN**
	OK		**MANUAL**
		ESC	To return to menu

Selecting this option, the system changes from the automatic control mode to the manual mode (Direct Mode). To activate "Manual mode", the system must be calibrated and "out of service", in case of one or both conditions are not satisfied, the error message is displayed:

REFUSED REQUEST:
INVALID SYSTEM STATE!
PRESS ESC/OK TO EXIT

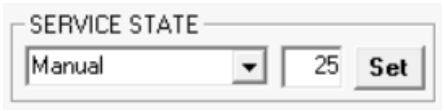
In manual mode, the required (variable value with ↑ / ↓ buttons) and current position are displayed.

OUT SVC CAL OK

REQPOS XXX.X%
ACTPOS XXX.X%

Operating with PC selecting the "Manual" option in the service pull-down menu, it's possible to insert the required position cell and confirm it, pushing the "Set" button.

SERVICE STATE
Out Of Service
Set
Out Of Service
In Service
Manual
Ack


SERVICE STATE
Manual
25
Set

3.7 FAIL & TRIP SETTING

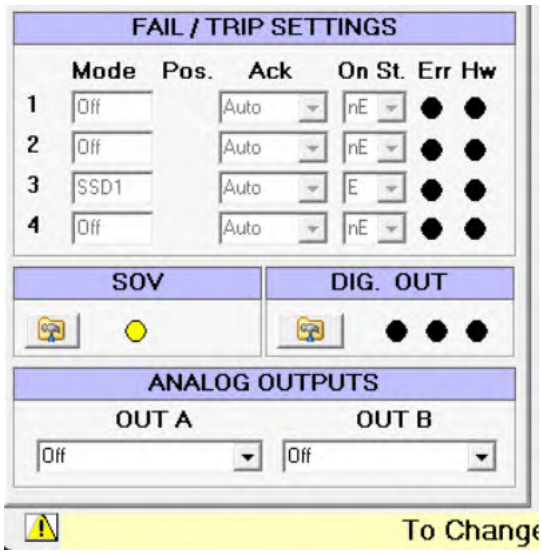
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
OK			FAIL & TRIP SETTING
	ESC		To return to main menu

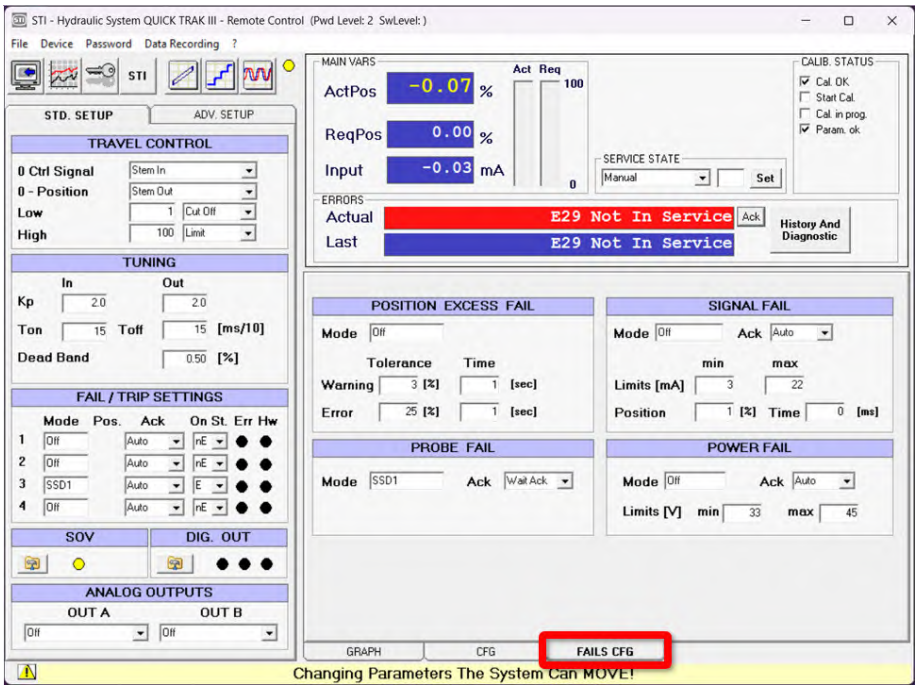
With this selection, it's possible to define the system behaviour in case of pressure, power or signal failure and/or activation of a trip signal.

This command displays the following sub menu:

SOV CONFIGURATION
POS.EXCESS FAIL MODE
POWER FAIL MODE
SIGNAL FAIL MODE
PRESSURE FAIL MODE
MODE FOR TRIP1
MODE FOR TRIP2
MODE FOR TRIP3
MODE FOR TRIP4

On the PC some of these options are displayed and can be customized in the main window, others are available in "FAILS CFG" tag.





3.7.1 SOV CONFIGURATION

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
OK			**FAIL & TRIP SETTING**
	OK		**SOV CONFIGURATION**
		ESC	To return to menu

Selecting this option, it's possible to display and modify the system configuration provided for the solenoid valves (SOV).

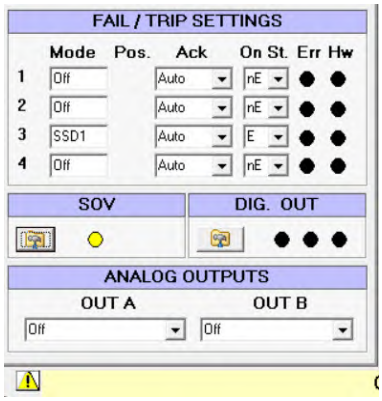
The following page is displayed:

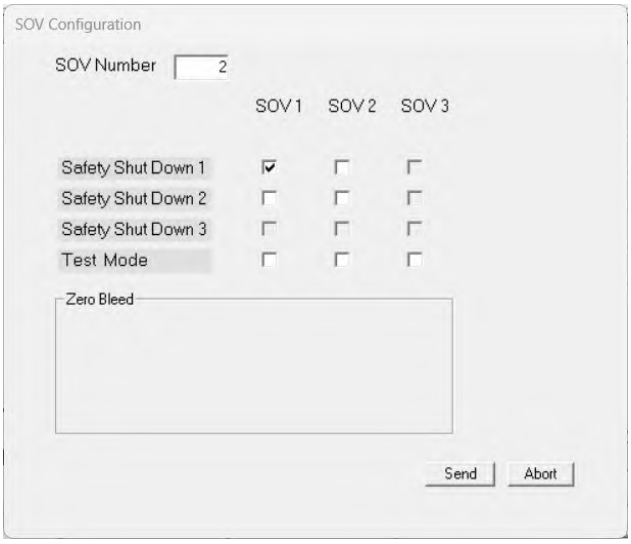
SOV N. 3 SOV1 SOV2 SOV3
RUNNING ON OFF OFF
SAFETY SD1 OFF OFF OFF
SAFETY SD2 ON OFF OFF
SAFETY SD3 OFF OFF OFF

In the first line, it's possible to configure the system SOV number (1, 2 or 3), in the second line the SOV configuration provided for running mode (normal operation mode); in next lines the SOV configuration provided for three specific cases: SAFETY SHUT DOWN 1, 2 and 3.

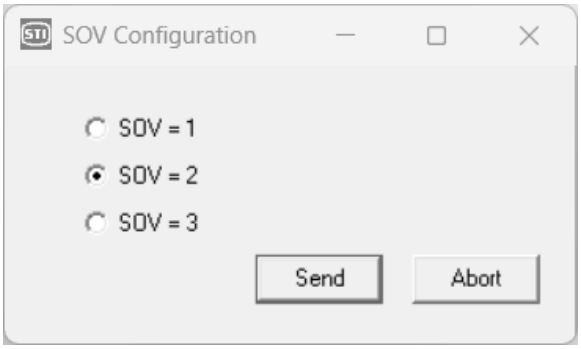
The active field will come out in reverse. With the OK selection, it's possible to change the active data field. With the ↑ / ↓ keys, it's possible to change the parameter option.

On the PC software, it's possible to display the SOV configuration, pressing the corresponding button in the "SOV Configuration" window.





To set the SOV number, double click on the corresponding cell, and press "SEND" to confirm the value or "ABORT" to exit from this window.



To set the SOV configuration in case of running, safety shut down 1, 2, 3 modes, check the selected options and press "SEND" to confirm the entire selection or "ABORT" to exit from this window.

3.7.2 POSITION EXCESS FAIL MODE

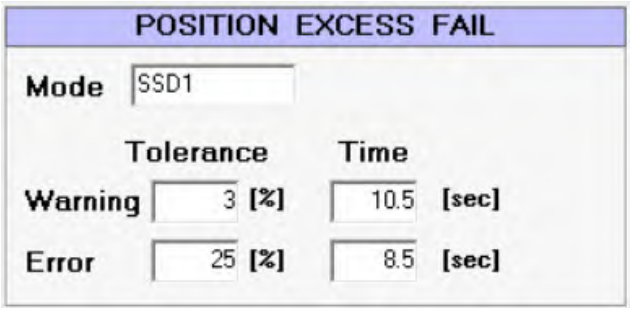
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
OK			FAIL & TRIP SETTING
	↓		SOV CONFIGURATION
	OK		POS.EXCESS FAIL MODE
		ESC	To return to menu

Selecting this command, it's possible to configure the max admissible position error and warning (difference between the required and the actual position) and the actions to be executed, if these limits are exceeded.

The following menu is displayed:

ERROR MODE OFF
EXCESS ERROR 25.0%
ERROR SECONDS 10.5 SEC
EXCESS WARN. 3.0%
WARN. SECONDS 8.5 SEC

On the PC, it's possible to configure all the selections and values in the "Position excess fail" panel.

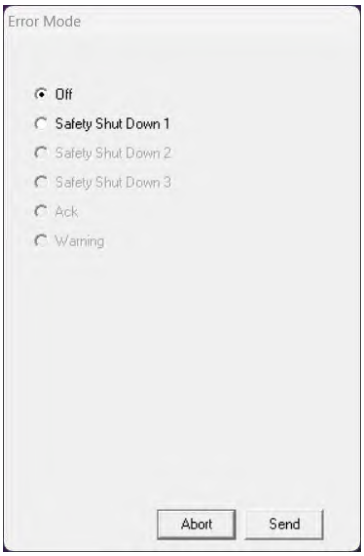


3.7.2.1 ERROR MODE

The first line allows to configure the action to be executed in case of excess position error; the selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the "SAFETY SD1" position corresponding to the "SAFETY SD1" SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the "SAFETY SD2" position corresponding to the "SAFETY SD2" SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the "SAFETY SD3" position corresponding to the "SAFETY SD3" SOV configuration.

On the PC, it's possible to configure the position error mode.
To set the value, double click on the corresponding cell, click the option and press "Ok" to confirm it or "Cancel" to exit.



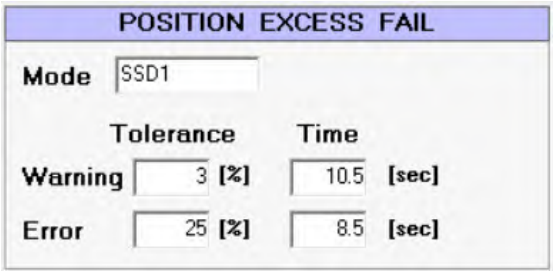
3.7.2.2 EXCESS ERROR

With this command, it's possible to set the max error position value (tolerance).

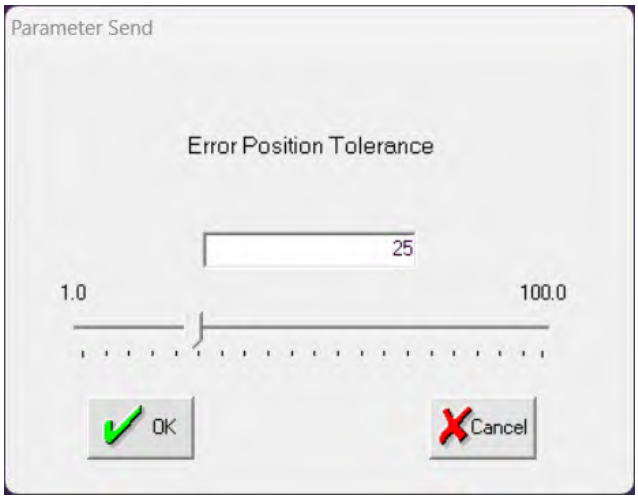
EXCESS ERROR
3.0 %
PRESS OK TO CONFIRM

The value can be changed by pressing the ↑ and ↓ keys in a range between 0÷100% and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC, it's possible to configure the parameter in the "Position excess fail" panel.



To set the value, double click on the corresponding cell, input the value and press "Ok" to confirm it or "Cancel" to exit.



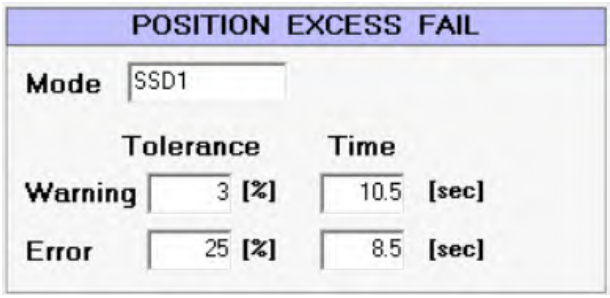
3.7.2.3 ERROR SECONDS

In case of error condition, this parameter defines the waiting time before the alarm is activated.

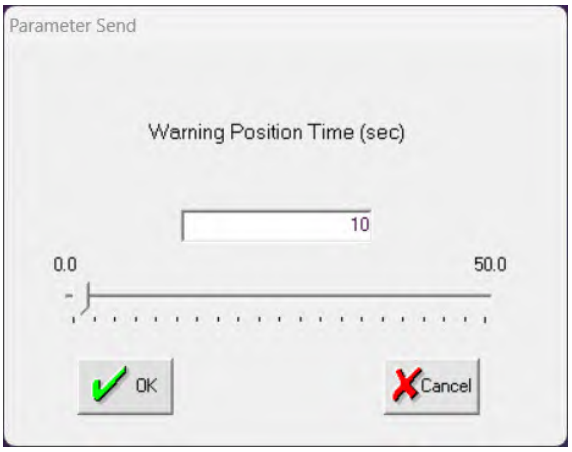
ERROR SECONDS
8.5 SEC
PRESS OK TO CONFIRM

The value can be changed by pressing the ↑ and ↓ keys in a range between 0÷5000 seconds and subsequently confirmed with OK. Press ESC to return to the previous menu.

From the PC, it's possible to configure the parameter in the "Position excess fail" panel located in "FAILS CFG" tag.



To set the value, double click on the corresponding cell, input the value and press "Ok" to confirm it or "Cancel" to exit.



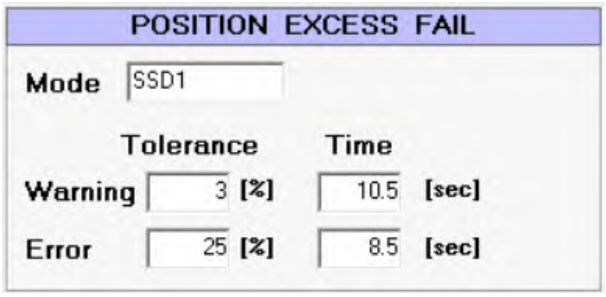
3.7.2.4 EXCESS WARNING

The selection allows to set the max warning position value (tolerance) in the 0÷100% range.

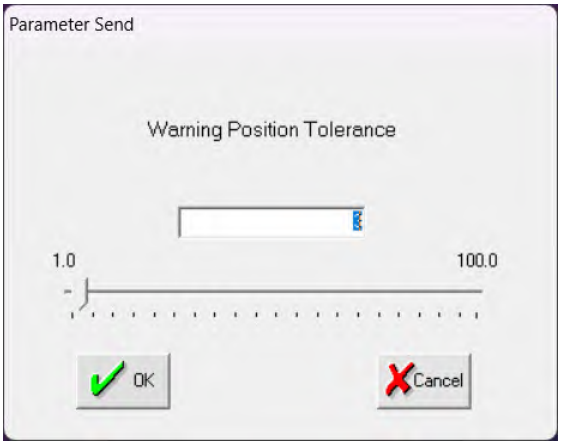
EXCESS WARN.
3.0 %
PRESS OK TO CONFIRM

The value can be changed by pressing the ↑ and ↓ keys and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC, it's possible to configure the parameter in the "Position excess fail" panel.



To set the value, double click on the corresponding cell, input the value and press "OK" to confirm it or "Cancel" to exit.



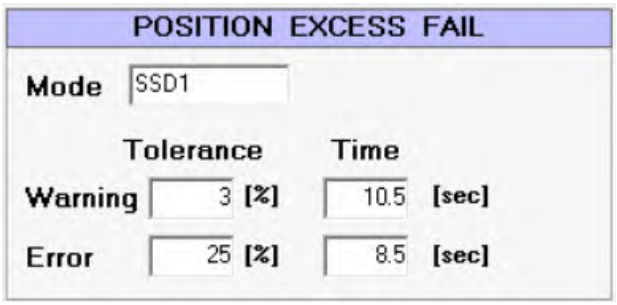
3.7.2.5 WARNING SECONDS

In case of warning condition this value is the waiting time before the alarm is activated. It's possible to insert a value in the range of 0÷1000 seconds.

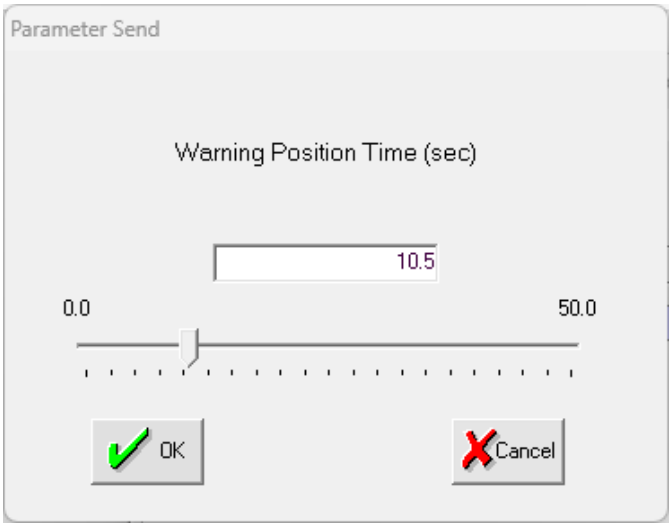
WARN. SECONDS
10.5 SEC
PRESS OK TO CONFIRM

The value can be changed by pressing the ↑ and ↓ keys and confirmed with OK. Press ESC to return to the previous menu.

On the PC, it's possible to configure the parameter in the "Position excess fail" panel.



To set the value, double click on the corresponding cell, input the value and press "OK" to confirm it or "Cancel" to exit.



3.7.3 POWER FAIL MODE

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
OK			FAIL & TRIP SETTING
	↓		SOV CONFIGURATION
	↓		POS.EXCESS FAIL MODE
	OK		POWER FAIL MODE
		ESC	To return to menu

Selection of this command allows to define the minimum and maximum admissible power to the main PCB, and to configure the power fail condition.

The displayed menu is:

ERROR MODE OFF
END MODE AUTO
POWER LIMIT

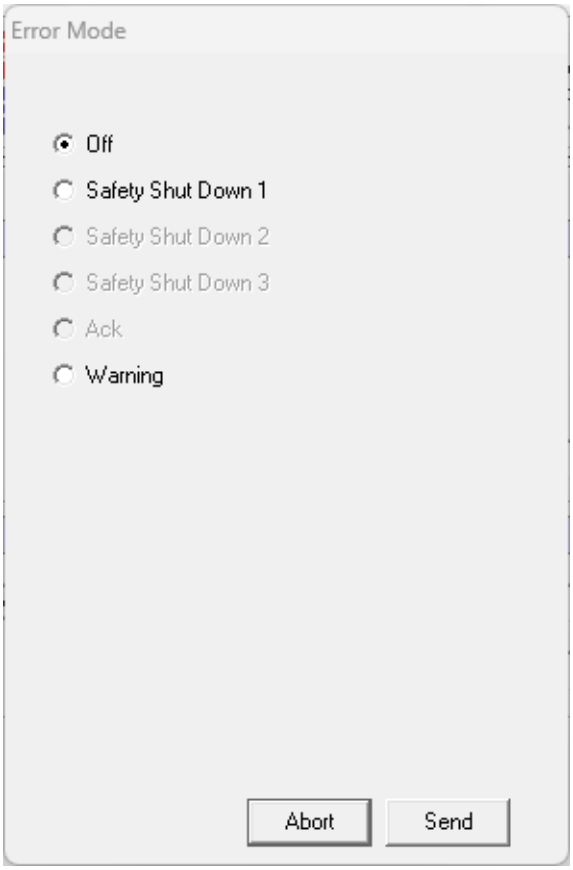
On the PC, is possible to configure all the selections and values in the “Power fail” panel.

3.7.3.1 ERROR MODE

The first line allows to configure the action to be executed in case of low voltage supply power. The selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the “SAFETY SD1” position corresponding to the “SAFETY SD1” SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the “SAFETY SD2” position corresponding to the “SAFETY SD2” SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the “SAFETY SD3” position corresponding to the “SAFETY SD3” SOV configuration.
WARNING	All cases	On the positioner display will be shown a warning message

On the PC, it’s possible to configure the power error mode.
To set the value, double click on the corresponding cell, click the option and press “SEND” to confirm it or “ABORT” to exit.

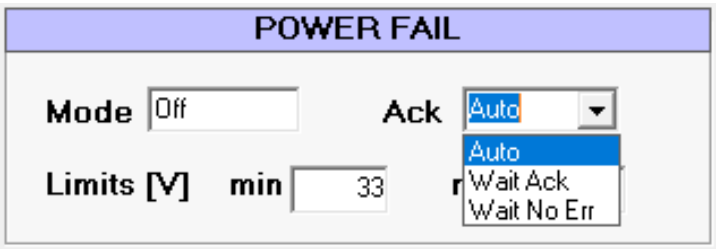

Error Mode
Off
Safety Shut Down 1
Safety Shut Down 2
Safety Shut Down 3
Ack
Warning
Abort
Send

3.7.3.2 END MODE

The end mode option allows to configure the action to be executed at the end of the error conditions, the selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	EXECUTED ACTION
AUTO	Automatic return to normal working condition without waiting for confirmation.
WAIT ACK	A confirmation is required before returning to normal working condition.
WAIT NOERR	Automatic return to normal working condition only if all error conditions have been cleared.

On the PC, it is possible to choose the power fail end mode, selecting the option on the corresponding pull-down menu.



3.7.3.3 POWER LIMIT

A list with high and low power limit values is displayed:

POW.LIMIT LOW 33.0V
POW.LIMIT HIGH 45.0V

Selecting the first line, it is possible to modify the low voltage supply limit value.

POW. LIMIT LOW
33.0 V
PRESS OK TO CONFIRM

The admissible range is between 0 to 50 Vdc.
The value can be changed by pressing the ↑ and ↓ keys and subsequently confirmed with OK. Press ESC to return to the previous menu.

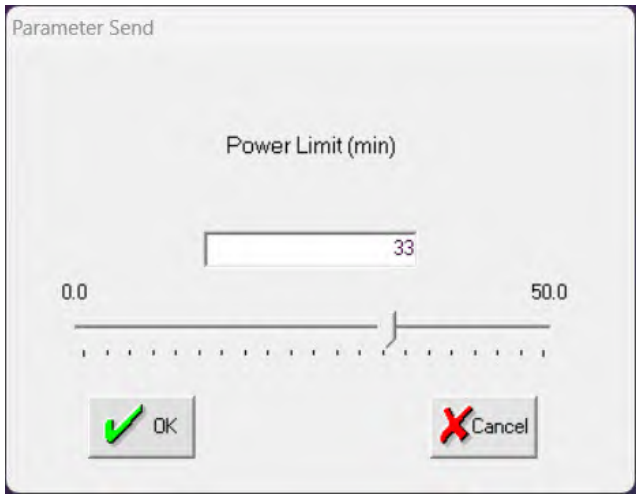
Selecting the second line, it is possible to modify the high voltage supply limit value.

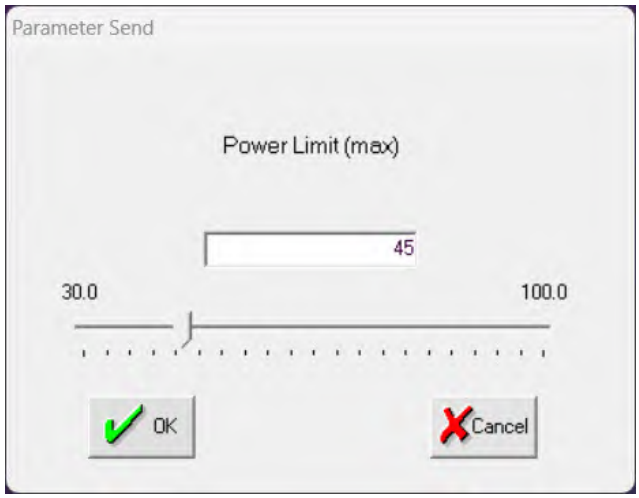
POW. LIMIT HIGH
45.0 V
PRESS OK TO CONFIRM

The admissible range is between 30 to 100 Vdc.
The value can be changed by pressing the ↑ and ↓ keys and subsequently confirmed with OK. Press ESC to return to the previous menu.

On the PC, it is possible to modify the low and high power limits.
To set the parameters, double click on the selected cell, input the value and press “OK” to confirm it or “Cancel”

to exit from the input window.





3.7.4 SIGNAL FAIL MODE

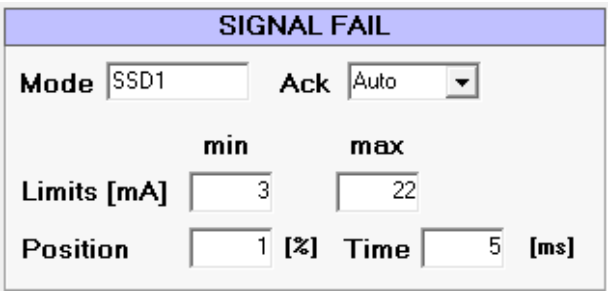
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
OK			FAIL & TRIP SETTING
	↓		SOV CONFIGURATION
	↓		POS.EXCESS FAIL MODE
	↓		POWER FAIL MODE
	OK		SIGNAL FAIL MODE
		ESC	To return to menu

This command allows to configure the minimum and maximum admissible inlet signal (mA), the actions to be executed if these limits are reached and the error clearing condition.

Selecting the option the following menu is displayed:

ERROR MODE OFF
END MODE AUTO
SIGNAL LIMIT
ACTUATOR POSITION

On the PC, it's possible to configure all the selections and values in the "Signal fail" panel located in "FAILS CFG" tag.



3.7.4.1 ERROR MODE

The first line allows to configure the action to be executed in case of an out of range or fail signal. The selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options and relevant actions are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the “SAFETY SD1” position corresponding to the “SAFETY SD1” SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the “SAFETY SD2” position corresponding to the “SAFETY SD2” SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the “SAFETY SD3” position corresponding to the “SAFETY SD3” SOV configuration.
SPOOL **(PNEU)**	All cases	The actuator is driven to a specific position using the spool (see actuator position).
FREEZE **(PNEU)**	All cases	Actuator freezes in last position.
WARNING	All cases	On the positioner display will be shown a warning message

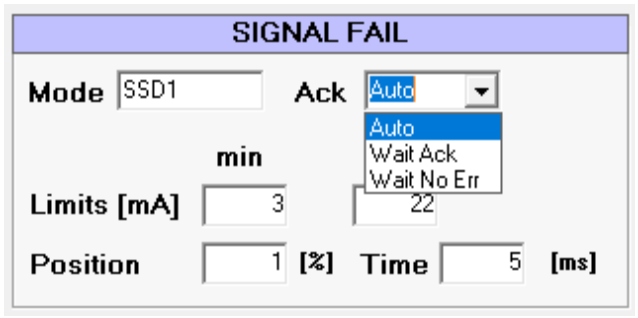
On the PC, it’s possible to configure the signal error mode.
To set the value, double click on the corresponding cell, click the option and press “Send” to confirm it or “Abort” to exit.

3.7.4.2 END MODE

The end mode option configures the action to be executed at the end of the error conditions. The selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	EXECUTED ACTION
AUTO	Automatic return to normal working condition without waiting for confirmation.
WAIT ACK	A confirmation is required before returning to normal working condition.
WAIT NOERR	Automatic return to normal working condition only if all error conditions have been cleared.

On the PC, it is possible to choose the power end mode selecting the option on the corresponding pull-down menu.



3.7.4.3 SIGNAL LIMIT

A list with high and low signal limit values is displayed:

SIGN.LIMIT LOW 3.0
SIGN.LIMIT HIGH 22.0

Selecting the first line, it is possible to modify the low limit, using the □ and □ keys and the OK button to confirm.

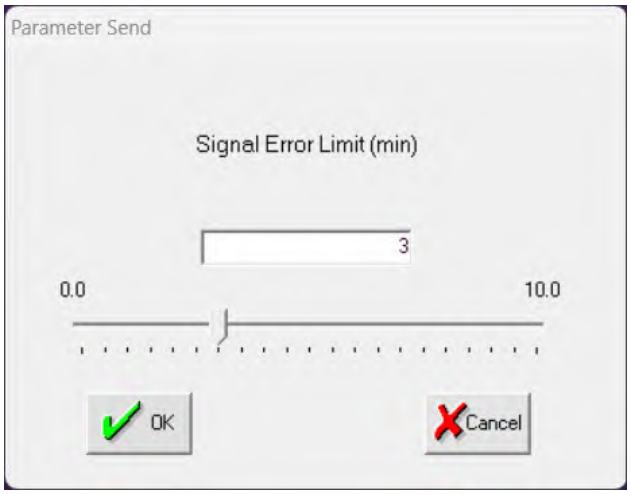
SIGN. LIMIT LOW
3.0
PRESS OK TO CONFIRM

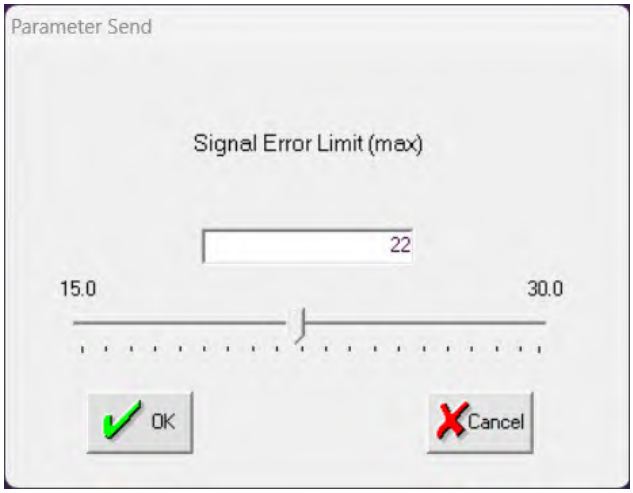
For upper signal limit, the displayed message is:

SIGN. LIMIT HIGH
22.0
PRESS OK TO CONFIRM

On the PC, it is possible to configure all the values in the “Signal fail” panel.

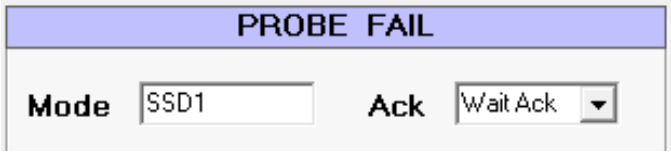
To set the value, double click on the selected cell, input the value and press “OK” to confirm it or “Cancel” to exit from the input window.





3.7.5 PROBE FAIL

Starting from DSP release 4.01 is available ONLY on PC software the Probe fail error configuration.
To configure this error refer to Probe Fail window located in “FAILS CFG” tag.



3.7.5.1 PROBE FAIL ERROR MODE

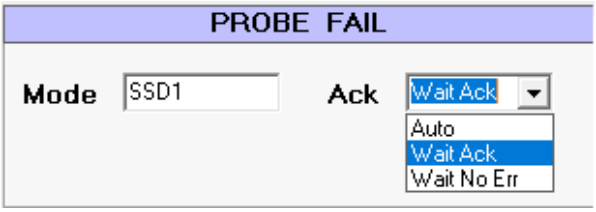
On PC software is possible to configure the error mode double clicking on Probe Fail area and select the related function. The available options are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the “SAFETY SD1” position corresponding to the “SAFETY SD1” SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the “SAFETY SD2” position corresponding to the “SAFETY SD2” SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the “SAFETY SD3” position corresponding to the “SAFETY SD3” SOV configuration.
WARNING	All cases	On the positioner display will be shown a warning message

3.7.5.2 PROBE FAIL END MODE

The end mode option allows to configure the action to be executed at the end of the error conditions. The available options are:

OPTION	EXECUTED ACTION
AUTO	Automatic return to normal working condition without waiting for confirmation.
WAIT ACK	A confirmation is required before returning to normal working condition.
WAIT NOERR	Automatic return to normal working condition only if all error conditions have been cleared.



3.7.6 TRIPS MODE (for trip 1, 2, 3, 4)

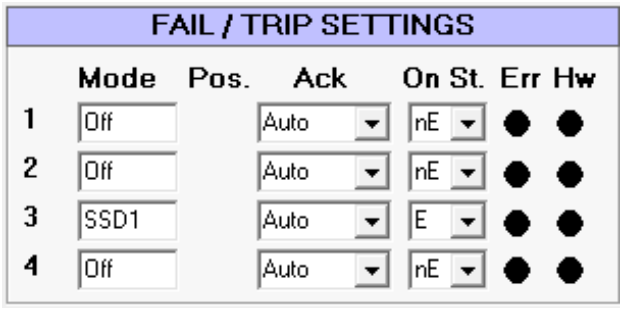
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
OK			FAIL & TRIP SETTING
	↓		SOV CONFIGURATION
	↓		POS.EXCESS FAIL MODE
	↓		POWER FAIL MODE
	↓		SIGNAL FAIL MODE
	↓		PRESSURE FAIL MODE (PNEU)
	OK		MODE FOR TRIP1-4
		ESC	To return to menu

This option allows to configure the position of the actuator when the trip 1 (or 2, 3, 4) is fired, the actions to be executed and the trip clearing condition.

With the selection of one of the available trips, the displayed menu is:

ERROR MODE OFF
END MODE AUTO
ACTUATOR POSITION
ON STATUS NOT ENERG.

On the PC, all these options could be configured from the “Trips” panel located in main window.



3.7.6.1 ERROR MODE

The first line allows to configure the action to be executed in case of trip signal, the selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	APPLICABILITY	EXECUTED ACTION
OFF	All cases	Nothing
SAFETY SD1	At least one solenoid valve available	The actuator goes to the “SAFETY SD1” position corresponding to the “SAFETY SD1” SOV configuration.
SAFETY SD2	At least two solenoid valves available	The actuator goes to the “SAFETY SD2” position corresponding to the “SAFETY SD2” SOV configuration.
SAFETY SD3	Three solenoid valves available	The actuator goes to the “SAFETY SD3” position corresponding to the “SAFETY SD3” SOV configuration.
SPOOL **(PNEU)**	All cases	The actuator is driven to a specific position using the spool (see actuator position).
FREEZE **(PNEU)**	All cases	Actuator freezes in last position.
ACK	All cases	Trip is used for the error acknowledgment in remote mode.
EXTERNAL SOV **(PNEU)**	All cases	External safety shut down valve has been activated.
WARNING	All cases	On the positioner display will be shown a warning message

On the PC, it’s possible to configure the signal error mode.
To set the value, double click on the corresponding cell, click the option and press “SEND” to confirm it or “ABORT” to exit.

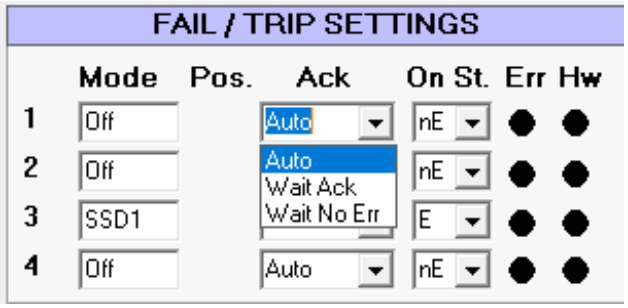
3.7.6.2 END MODE

The end mode option allows to configure the action to be executed at the end of the error conditions, the

selection can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION	EXECUTED ACTION
AUTO	Automatic return to normal working condition without waiting for confirmation.
WAIT ACK	A confirmation is required before returning to normal working condition.
WAIT NOERR	Automatic return to normal working condition only if all error conditions have been cleared.

On the PC, it is possible to choose the trip end mode, selecting the option on the corresponding pull-down menu.



3.7.6.3 ON STATUS

This option allows to configure the ON status for the selected trip; the changing can be made by selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are:

OPTION		DESCRIPTION
E	= ENERGIZED	ON Status = Energized. Corresponds to “1” state.
nE	= NOT ENERG.	ON Status = NOT Energized. Corresponds to “0” state.

On the PC, it is possible to choose the trip ON status, selecting the option on the corresponding pull-down menu.

3.8 GENERAL SETTING

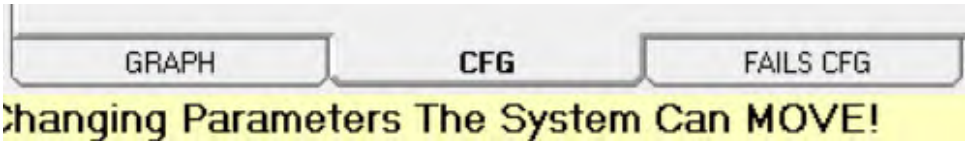
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	ESC		To return to main menu

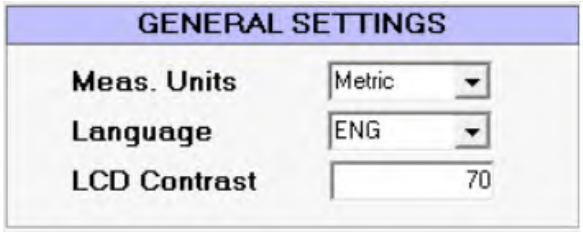
This menu allows to customize the system.

The displayed menu is:

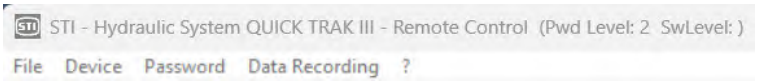
MEASUR UNITS MET/IMP
LANGUAGE ENGLISH
DATE & TIME
PASSWORD
CONTRAST

On the PC, only some of these data are available into the “General setting” panel located in CFG tag.





The password login and changing are available in the main command line (pull-down password menu).



3.8.1 MEASUREMENTS UNITS

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	OK		MEASUR UNITS
		ESC	To return to menu

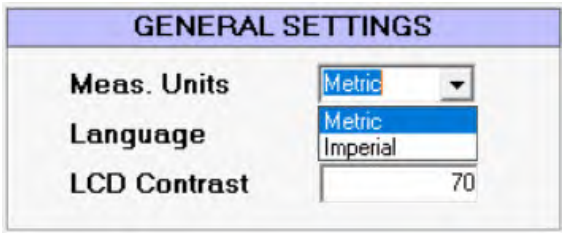
This command allows to configure the measurement unit’s system used to display the variables.

The configuration can be made by selecting the line with the up / down buttons, scrolling the options by pushing

the OK key and choosing between ISO metrical system (MET) and imperial system (IMP).

VARIABLE	ISO Metrical system	Imperial system
Pressure	bar	Psi
Temperature	°C	°F

On the PC, it is possible to choose the measurement units system, selecting the option on the corresponding pull-down menu.



3.8.2 LANGUAGE

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	↓		MEASUR UNITS
	OK		LANGUAGE
		ESC	To return to menu

The available option for the language is English.

3.8.3 DATE AND TIME

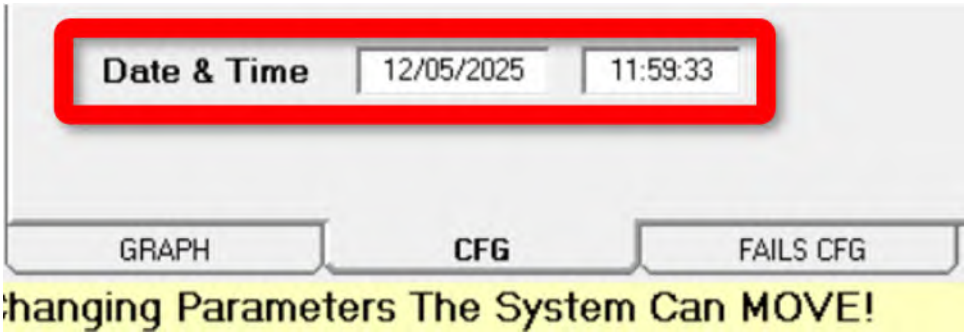
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	↓		MEASUR UNITS
	↓		LANGUAGE
	OK		DATE & TIME
		ESC	To return to menu

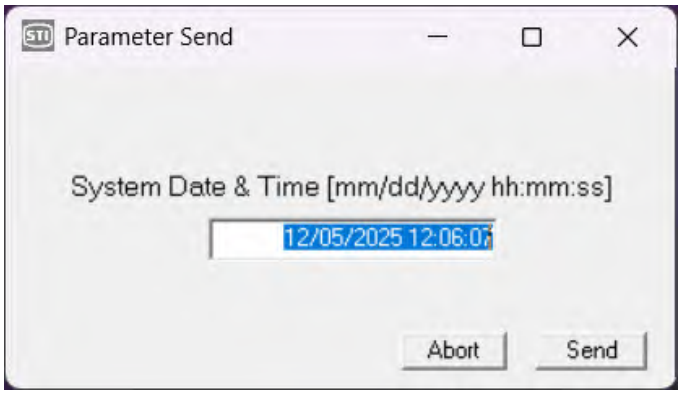
This option allows to configure the system date and time.

[mm/dd/yyyy]
10 / 03 / 2007
12: 25: 41

Every value can be modified using the up / down buttons and the OK key to confirm it.

On the PC, it is possible to modify the system date and time.
To set the value, double click on the corresponding cells located in CFG tag, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.





3.8.4 PASSWORD

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	↓		MEASUR UNITS
	↓		LANGUAGE
	↓		DATE & TIME
	OK		PASSWORD
		ESC	To return to menu

With this selection, it's possible to change the user password.

The following menu is displayed:

PASSWORD: _ _ _ _ _
CONFIRM: _ _ _ _ _

A sequence of 5 push buttons is required to define the user password, used to enter the system from the local panel (the device is supplied by the manufacturer with the default user password [OK ↑ ↓ ↑ ↓]).
On the PC, a sequence of alfa-numerical digits is required (default is 12345).

3.8.5 CONTRAST

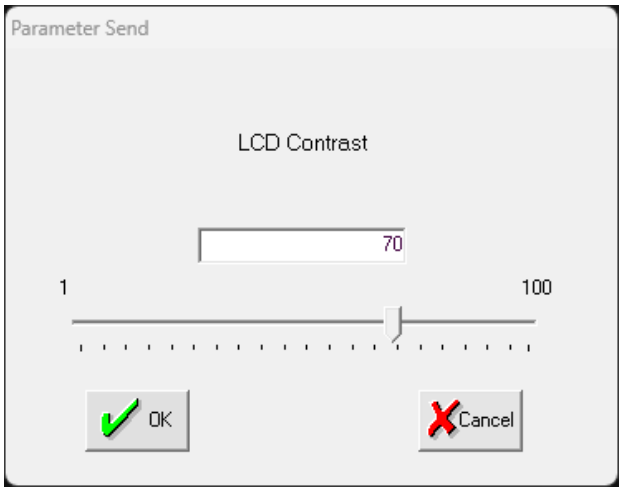
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
OK			GENERAL SETTING
	↓		MEASUR UNITS
	↓		LANGUAGE
	↓		DATE & TIME
	↓		PASSWORD
	OK		CONTRAST
		ESC	To return to menu

Selecting this option, it's possible to adjust the contrast of the local control device monitor.

CONTRAST
070

The value can be changed in a range between 1 and 100 using the up / down buttons and can be confirmed by the OK key.

On the PC, it is possible to adjust the contrast from the "General setting" panel.



To set the value, double click on the corresponding cell, input the value and press "OK" to confirm it or "Cancel" to exit from the input window.

3.9 SYSTEM DATA

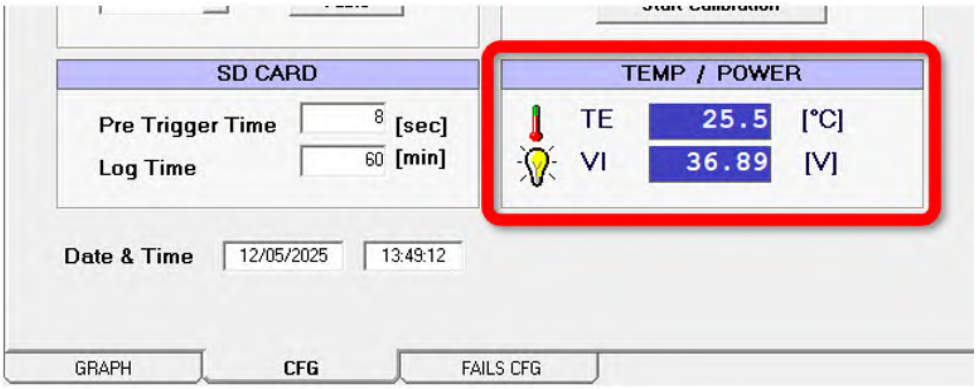
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
OK			SYSTEM DATA
	ESC		To return to main menu

This option shows on the local control panel display the values of the electronic board temperature (TE) and the supply power voltage (VI) on the main PCB.

SYSTEM DATA

TE XXX.X C
VI X:XX V

On the PC, these values are displayed in “CFG” tag



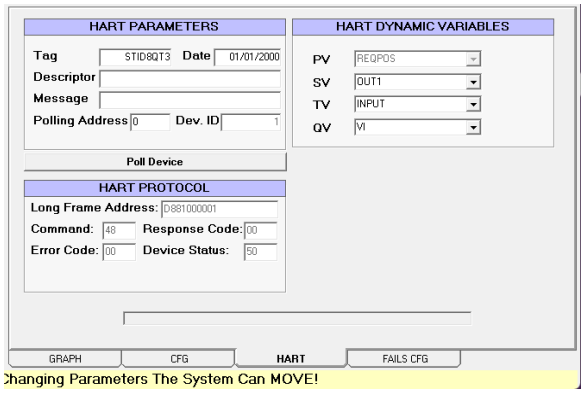
3.10 COMMUNICATION

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
OK			**COMMUNICATION**
	ESC		To return to main menu

Selecting the only (at the present time) available option in the menu COMMUNICATION, it's possible to enter the HART PROTOCOL 6.0 parameters list.

HART TAG
MESSAGE
DESCRIPTOR
DATE
POLLING ADDRESS 0
DEVICE ID 1

On the PC, these data are available in the "HART" tag. Note that this tag in displayed only when the software is connected in HART mode.



3.10.1 HART TAG

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
OK			**COMMUNICATION**
	OK		**HART TAG**
		ESC	To return to menu

This option allows to display the HART parameter named Tag.

HART TAG
STID881
PRESS ESC/OK TO EXIT

The Tag is a 8 character label assigned by the end user based on the location and use of the field device. It's a

8 character (6 byte) Packed ASCII string used to identify the field device. The term originated when physical tags were attached to instruments for this purpose.
It's not possible to modify the Tag parameter by the local user interface.

This operation is possible on the PC, from the "Communication" panel.

To set the value, double click on the corresponding cell, input the value and press "SEND" to confirm it or "ABORT" to exit from the input window.

3.10.2 MESSAGE

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
OK			**COMMUNICATION**
	↓		**HART TAG**
	OK		**MESSAGE**
		ESC	To return to menu

This option allows to display the HART parameter named Message.

MESSAGE
…first 16 chars
…second 16 chars
PRESS ESC/OK TO EXIT

The Message is a 32 character (24 byte) Packed ASCII string used by the Master for record keeping.
The default value is a blanked string, 32 bytes long.
It's not possible to modify the Message parameter by the local user interface.

This operation is possible on the PC, from the "Communication" panel.

To set the value, double click on the corresponding cell, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.

3.10.3 DESCRIPTOR

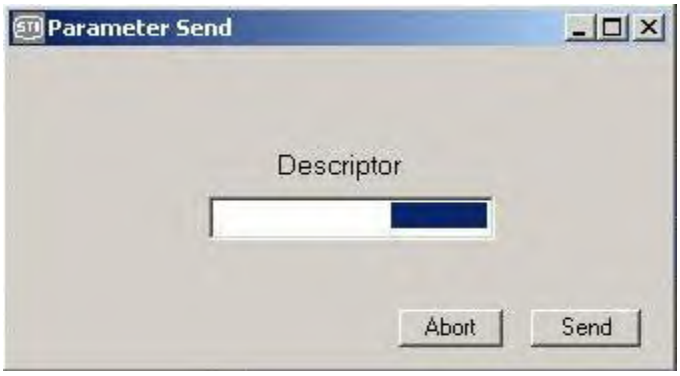
↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
OK			**COMMUNICATION**
	↓		**HART TAG**
	↓		**MESSAGE**
	OK		**DESCRIPTOR**
		ESC	To return to menu

This option allows to display the HART parameter named Descriptor.

DESCRIPTOR
…….16 chars
PRESS ESC/OK TO EXIT

The Descriptor is a 16 character (12 byte) Packed ASCII string used by the Master for record keeping.
The default value is a blanked string, 16 bytes long.
It’s not possible to modify the Descriptor parameter by the local user interface.

This operation is possible on the PC, from the “Communication” panel.



To set the value, double click on the corresponding cell, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.

3.10.4 DATE

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
OK			**COMMUNICATION**
	↓		**HART TAG**
	↓		**MESSAGE**
	↓		**DESCRIPTOR**

	OK		**DATE**
		ESC	To return to menu

This option allows to display and/or modify the HART parameter named Date.

DATE [mm/dd/yyyy]
05/29/2006
PRESS ESC TO EXIT

The date is represented by three 8-bit binary unsigned integers representing, respectively, the day, month and year (minus 1900). It's a date code, used by the Master for record keeping (e.g. last or next calibration date).
In this page, the 4 provided keys are OK, ↑, ↓ and ESC and they have the following function:
OK key allows to shift from a field to another one of the page or in clockwise direction from day to month and to year.
Key ↑ once pointed out the interest field, the current value is allowed to increase according to the field standards (ex.: day field including between 1 and 31);
Key ↓ once pointed out the concern field, the current value is allowed to decrease according to the field standards (ex.: month field including between 1 and 12);
The ESC key allows to return to the Hart Protocol submenu.

On the PC, it is possible to modify the Date parameter from the "Communication" panel.

To set the value, double click on the corresponding cell, input the value and press "SEND" to confirm it or "ABORT" to exit from the input window.

3.10.5 POLLING ADDRESS

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
OK			**COMMUNICATION**
	↓		**HART TAG**
	↓		**MESSAGE**
	↓		**DESCRIPTOR**
	↓		**DATE**
	OK		**POLLING ADDRESS**
		ESC	To return to menu

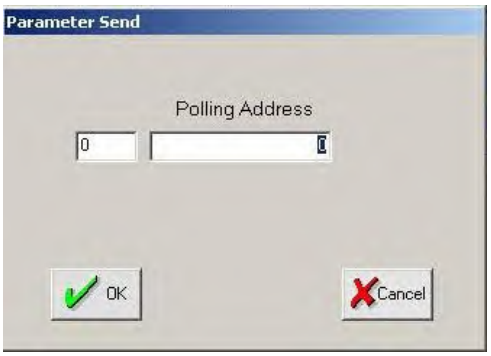
This option allows to display and/or modify the HART parameter named Polling Address.

POLLING ADDRESS
00
PRESS OK TO CONFIRM

In the HART Protocol, the polling address is an integer used to identify the field device. It is used to construct the Short Frame Address. The Polling Address is set to 0 in point to point installations.

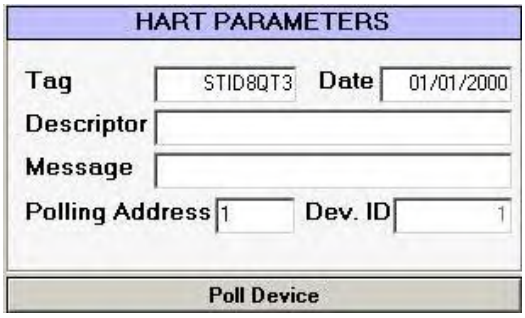
The 4 keys provided in this page have the following function:
Key ↑ allows to increase the current value of polling address within a foreseen range from 0 and 15;
Key ↓ allows to decrease the current value of polling address, within a foreseen range from 0 and 15;
OK key confirms the defined polling address and allows to return to the submenu Hart Protocol.
ESC key cancels any current modification phase and allows to return to the Hart Protocol submenu.

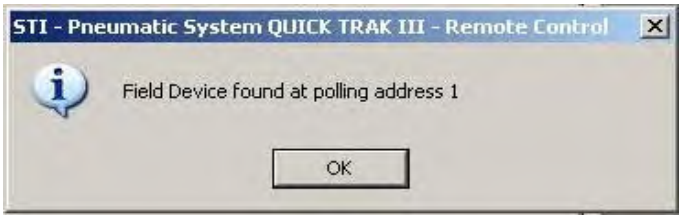
On the PC, it is possible to modify the Polling Address from the “Communication” panel.



To set the value, double click on the corresponding cell, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.

The master usually reaches the devices, starting from polling address equal to 0.
In multi-drop installations all the field devices are generally configured to a different polling address to allow automatic identification by the master.
Using the “Poll” command button, it’s possible to identify a device having the polling address not equal to 0.





3.10.6 DEVICE ID

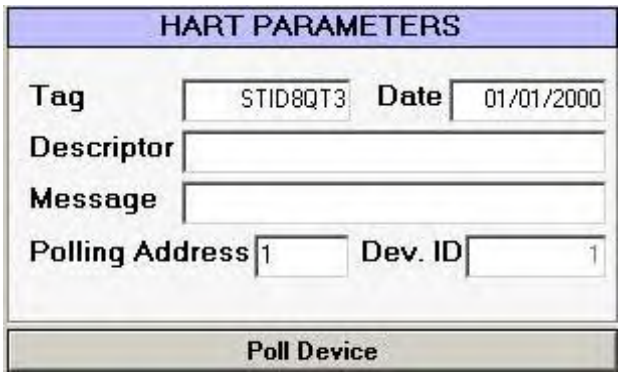
↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
OK			COMMUNICATION
	↓		HART TAG
	↓		MESSAGE

	↓		DESCRIPTOR
	↓		DATE
	↓		POLLING ADDRESS
	OK		DEVICE ID
		ESC	To return to menu

This option allows to display the HART parameter named Device ID (integer number).

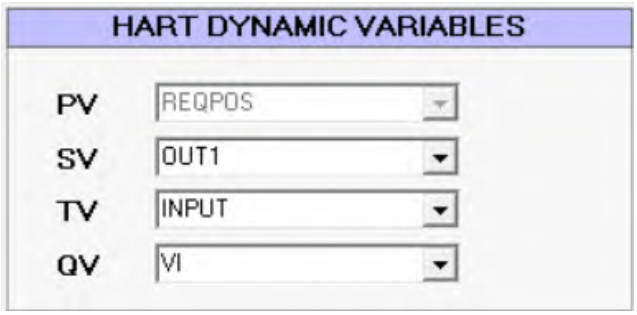
This number is different for every device manufactured with a given Manufacturer ID and Device Type. It returned in bytes 9-11 of Identity Commands and for the QuickTrak IIIH (Hydraulic) it coincides with the system serial number (Part Number).

It's not possible to modify the Device ID parameter by the local user interface or by remote; this value changes if the Part Number parameter is modified. See chapter ADVANCED for details.



3.10.7 HART DYNAMIC VARIABLES

This menu is used to change the device HART dynamic variables assignments for the Secondary Variable (SV), the Tertiary Variable (TV) and the Quaternary Variable (QV). The Primary Variable (PV) is fixed and always linked to REQPOS.



3.11 DIAGNOSTIC

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
OK			DIAGNOSTIC
	ESC		To return to main menu

This option allows to display the system diagnostic information.

The following sub menu is displayed:

STROKE KM XXXXXX.XX
IN SVC HOURS XXXXXX.XX
MIN TEMP. XXX.XC
MAX TEMP. XXX.XC
AVER.TEMP. XXX.XC
PERM. TIME
dP UP-DOWN **(PNEU)**
ERROR STAT
CALIB STAT
OUT SVC STAT
IN SVC STAT
STAT FREQ

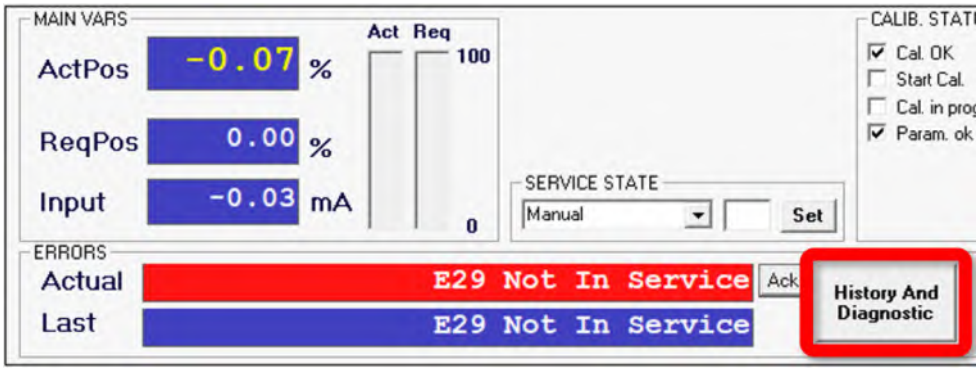
with some data directly available:

STROKE KM XXXXXX.XX
IN SVC HOURS XXXXXX.XX
MIN TEMP. XXX.XC
MAX TEMP. XXX.XC
AVER.TEMP. XXX.XC

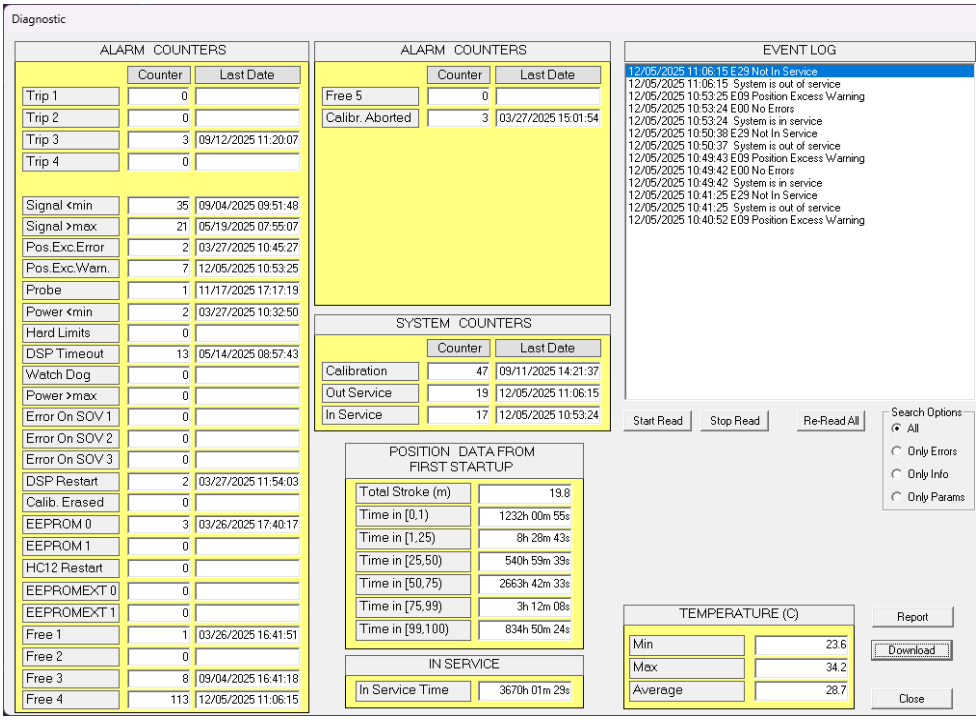
where:

- STROKE KM is the total distance covered by the stem (piston) expressed in [km]
- IN SVC HOURS the total time of working [h]
- MIN TEMP. is the minimum temperature reached during the use
- MAX TEMP. is the maximum temperature reached during the use
- AVER.TEMP is the average temperature during the use

On the PC, pushing the “History And Diagnostic” button located in main page:



It's possible to display the system diagnostic data page:



From this page, press the "Download" command button to read or refresh the system diagnostic data. Press the "Report" command button to save the data in RTF format.

Diagnostic Report

```
Report Date: 01/04/2009 17.43

Alarm          Counter       Date
Trip 1     :       1    04/01/2009 14:59:51
Trip 2     :       0
Trip 3     :       0
Trip 4     :       0
Pressure   :       0
Signal <min :      0
Signal >max :      0
Pos.Exc.Error:     0
```

```
Pos.Exc.Warn.:      0
Probe     :     1   04/01/2009 12:52:14
Power <min   :      0
Hard Limits :       0
DSP Timeout :       0
Watch Dog   :      0
Power >max   :      0
Error On SOV 1:       0
Error On SOV 2:       0
Error On SOV 3:       0
DSP Restart :       0
Calib. Erased:       0
EEPROM 0    :      0
EEPROM 1    :      0
HC12 Restart :       0
EEPROMEXT 0 :       0
EEPROMEXT 1 :       0
Free 1      :      0
Free 2      :      0
Free 3      :      0
Free 4      :      0
Free 5      :      0
Calibr. Aborted:       0
0-Spool Error:      0
0-Spool Search:       0
Spool Limit :       0
Friction Warn.:       0
Encoder     :      0
Friction Error:       0
Index 1     :      0
Index 2     :      0

System        Counter       Date
Calibration :       0
Out Service :       0
In Service  :       0

TEMPERATURE (C)
Min  : 24.3
Max  : 33.0
Average: 27.7

In Service Time: 0h 00m 00s
Total Stroke (m): 0

Time in [0,1) : 3h 46m 10s
Time in [1,25) : 0h 00m 00s
Time in [25,50): 0h 00m 00s
Time in [50,75): 0h 00m 00s
Time in [75,99): 0h 00m 00s
Time in [99,100): 0h 00m 00s
```

```
Max Delta Pressure (bar)
[1,25)  Up: 0.00     Down: 0.00
[25,50) Up: 0.00     Down: 0.00
[50,75) Up: 0.00     Down: 0.00
[75,99) Up: 0.00     Down: 0.00

Events Log
04/01/2009 17:21:47 PRM: Part Number (Dev.ID): 1 -> 1
04/01/2009 15:01:51 PRM: SOV Number: 1 -> 3
04/01/2009 14:59:54 No Errors
04/01/2009 14:59:53 PRM: Trips ON St.: nE nE nE nE ->
E nE nE nE
04/01/2009 14:59:51 Trip 1
04/01/2009 14:59:51 PRM: Trip 1 Fail Mode: Off -> SSD1
04/01/2009 13:19:30 PRM: Power Fail Mode: Off -> Off
04/01/2009 12:56:05 PRM: Pos.Exc.Err.Mode: Off -> Off
04/01/2009 12:52:53 No Errors
04/01/2009 12:52:52 PRM: Probe. Fail Mode: SSD1 -> Off
04/01/2009 12:52:14 Probe Error
04/01/2009 12:52:13 System startup
04/01/2009 12:48:59 EEPROMEXT0 Error
04/01/2009 12:48:59 EEPROM Global Reset
04/01/2009 12:48:59 EEPROMEXT Global Reset
```

3.11.1 PERM. TIME

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
OK			**DIAGNOSTIC**
	↓		**STROKE KM**
	↓		**IN SVC HOURS**
	↓		**MIN TEMP.**
	↓		**MAX TEMP.**
	↓		**AVER.TEMP.**
	OK		**PERM. TIME**
		ESC	To return to menu

With this selection, it is possible to know the permanence time in defined range of the stroke. The stroke range expressed in percent of the stroke are the following:

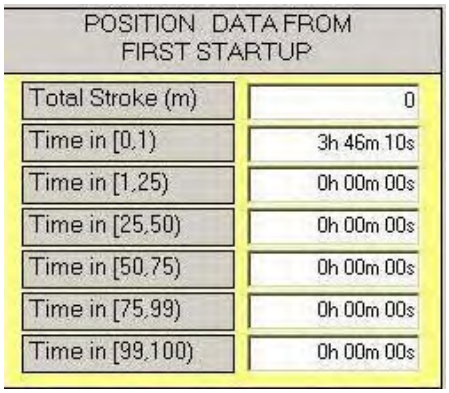
0 ÷ 1
1 ÷ 25
25 ÷ 50
50 ÷ 75
75 ÷ 99
99 ÷ 100

On the local control panel display the values expressed in hours are shown as it follows:

0-1 XXXXXXX.XXh
1-25 XXXXXXX.XXh
25-50 XXXXXXX.XXh
50-75 XXXXXXX.XXh
75-99 XXXXXXX.XXh
99-100 XXXXXXX.XXh

With ESC command, it is possible to return to the diagnostic menu.

On the PC, those values are available in the diagnostic page:



3.11.2 ERROR STAT

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
OK			**DIAGNOSTIC**
	↓		**STROKE KM**
	↓		**IN SVC HOURS**
	↓		**MIN TEMP.**
	↓		**MAX TEMP.**
	↓		**AVER.TEMP.**
	↓		**PERM. TIME**
	↓		**dP UP-DOWN (PNEU)**
	OK		**ERROR STAT**
		ESC	To return to menu

In this menu the error quantity, the date and time of the last error occurred are stored for each event.

Inside this menu the following error events are listed:

TRIP1
TRIP2
TRIP3
TRIP4
PRESSURE FAIL
LOW SIGNAL FAIL
HIGH SIGNAL FAIL
POS. EXCESS ERROR
POS. EXCESS WARNING
PROBE ERROR
LOW POWER FAIL
HARD LIMITS ERROR
DSP TIMEOUT

WATCH DOG ERROR
HIGH POWER FAIL
ERROR ON SOV1
ERROR ON SOV2
ERROR ON SOV3
DSP RESTART
CALIBRATION ERASED
FREE 1
FREE 2
FREE 3
FREE 4
FREE 5
ENCODER ERROR
EXC. FRICTION ERROR
INDEX1 NOT FOUND ERR
INDEX2 NOT FOUND ERR

The selection can be made by selecting the line with the up / down buttons and pushing the OK key.

Once selected the event, the error counter and the last error date are shown:

TITLE (it is the selected variable in the previous list)

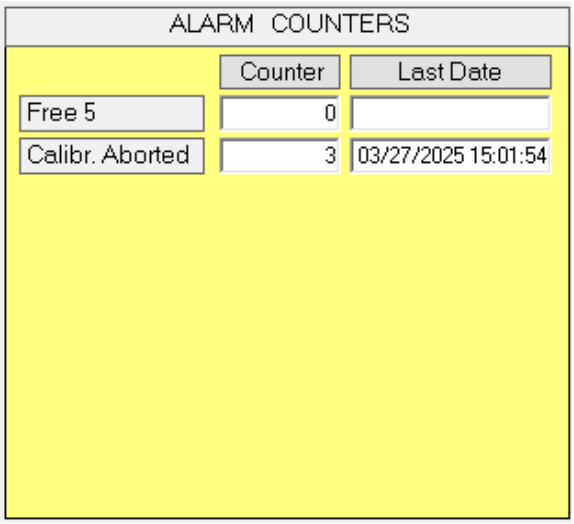
COUNTER: XXXXXXXXXX
LAST DATE: mm/dd/yyyy
hh:mm:ss

Press ESC or OK to return to the previous menu.

On the PC, the values are shown as below:

ALARM COUNTERS

	Counter	Last Date
Trip 1	0	
Trip 2	0	
Trip 3	3	09/12/2025 11:20:07
Trip 4	0	
Signal <min	35	09/04/2025 09:51:48
Signal >max	21	05/19/2025 07:55:07
Pos.Exc.Error	2	03/27/2025 10:45:27
Pos.Exc.Warn.	8	12/10/2025 15:19:45
Probe	1	11/17/2025 17:17:19
Power <min	2	03/27/2025 10:32:50
Hard Limits	0	
DSP Timeout	13	05/14/2025 08:57:43
Watch Dog	0	
Power >max	0	
Error On SOV 1	0	
Error On SOV 2	0	
Error On SOV 3	0	
DSP Restart	2	03/27/2025 11:54:03
Calib. Erased	0	
EEPROM 0	3	03/26/2025 17:40:17
EEPROM 1	0	
HC12 Restart	0	
EEPROMEXT 0	0	
EEPROMEXT 1	0	
Free 1	1	03/26/2025 16:41:51
Free 2	0	
Free 3	8	09/04/2025 16:41:18
Free 4	114	12/10/2025 15:19:49



3.11.3 CALIB STAT

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
OK			**DIAGNOSTIC**
	↓		**STROKE KM**
	↓		**IN SVC HOURS**
	↓		**MIN TEMP.**
	↓		**MAX TEMP.**
	↓		**AVER.TEMP.**
	↓		**PERM. TIME**
	↓		**dP UP-DOWN (PNEU)**
	↓		**ERROR STAT**
	OK		**CALIB STAT**
		ESC	To return to menu

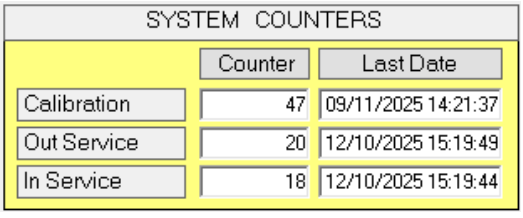
This selection shows the operator the statistical information about the instrument calibration routine (calibration number and last date).

On the local control panel the following values are shown:

CALIBRATION

COUNTER: XXXXXXXXXX
LAST DATE: mm/dd/yyyy
hh:mm:ss

Press ESC or OK to return to the diagnostic menu.
On the PC, the values are shown as below:



3.11.4 OUT SVC STAT

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
OK			DIAGNOSTIC
	↓		STROKE KM
	↓		IN SVC HOURS
	↓		MIN TEMP.
	↓		MAX TEMP.
	↓		AVER.TEMP.
	↓		PERM. TIME
	↓		dP UP-DOWN (PNEU)
	↓		ERROR STAT
	↓		CALIB STAT
	OK		OUT SVC STAT
		ESC	To return to menu

This selection shows the operator the statistical information about the “out of service” system state (counter and last date).

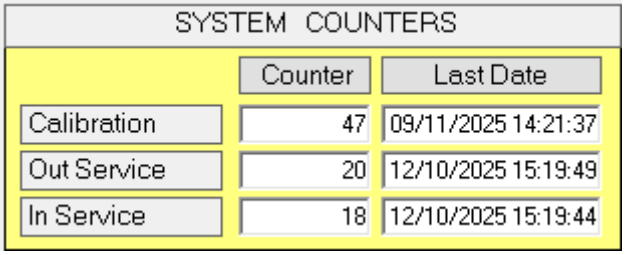
On the local control panel, the following data are shown:

OUT SVC

COUNTER: XXXXXXXXXX
LAST DATE: mm/dd/yyyy
hh:mm:ss

Press ESC or OK, to return to the diagnostic menu.

On the PC, the values are shown as below:



3.11.5 IN SVC STAT

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
OK			DIAGNOSTIC
	↓		STROKE KM
	↓		IN SVC HOURS
	↓		MIN TEMP.
	↓		MAX TEMP.
	↓		AVER.TEMP.
	↓		PERM. TIME

	↓		dP UP-DOWN (PNEU)
	↓		ERROR STAT
	↓		CALIB STAT
	↓		OUT SVC STAT
	OK		IN SVC STAT
		ESC	To return to menu

This selection shows the operator the statistical information about the “in service” system state (counter and last date).

On the local control panel the following data are shown:

IN SVC

COUNTER: XXXXXXXXXX
LAST DATE: mm/dd/yyyy
hh:mm:ss

Press ESC or OK, to return to the Diagnostic menu.

On the PC, the values are shown as below:

SYSTEM COUNTERS

	Counter	Last Date
Calibration	47	09/11/2025 14:21:37
Out Service	20	12/10/2025 15:19:49
In Service	18	12/10/2025 15:19:44

3.11.6 STAT FREQ

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
OK			DIAGNOSTIC
	↓		STROKE KM
	↓		IN SVC HOURS
	↓		MIN TEMP.
	↓		MAX TEMP.
	↓		AVER.TEMP.
	↓		PERM. TIME
	↓		dP UP-DOWN (PNEU)
	↓		ERROR STAT
	↓		CALIB STAT
	↓		OUT SVC STAT
	↓		IN SVC STAT
	OK		STAT FREQ
		ESC	To return to menu

This selection allows to modify the storage frequency of the diagnostic data.

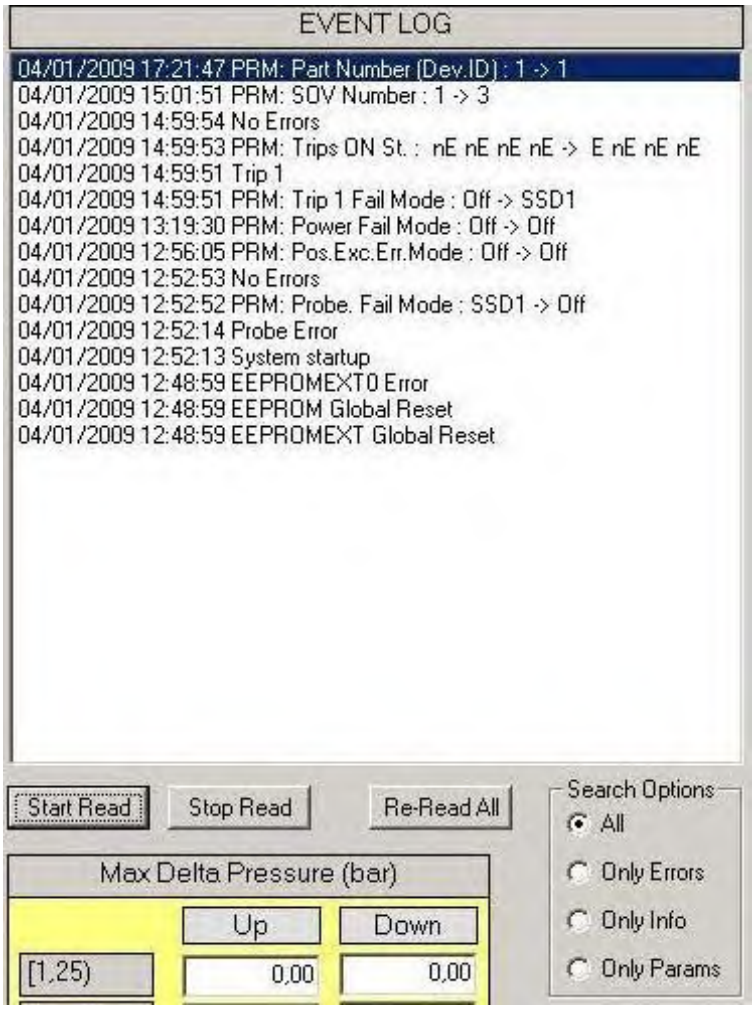
On the display, the following message appears:

STAT FREQ ON
01:00
PRESS OK TO CONFIRM

From this page, it's possible to change the storage frequency, using the ↑ / ↓ buttons, to confirm the value with the OK key or to cancel the selection pressing the ESC key.
Setting 00:00, the storage frequency is disabled.
It's not possible to change this parameter by remote, on the PC.

3.11.7 EVENT LOG

AVAILABLE ONLY ON PC SW. This function allow to read the history of events.



It is possible to configure the data that must be displayed directly from the "Search Options" area. The options are: Only errors: will display only error conditions when present – Only info: will display the data only on a change of info condition – Only Params: will display only the parameters when change - All: will display all the events
Using the button is possible to start stop the reading or re-read all the history.

3.12 ADVANCED

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
↓			DIAGNOSTIC
OK			ADVANCED
	ESC		To return to main menu

This option allows to display the advanced menu data on PC software the advanced data and further configurations are inserted in ***STI MENU***.

In order to enter this menu from the local panel, the advanced level password is required.

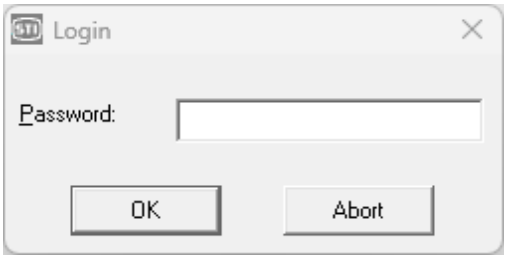
PASSWORD: *****

The device is supplied by the manufacturer with the default advanced level password:
[OK ↑ ↓ ↑ OK].
At the end of the login phase, the advanced menu will appear on the screen:

PROBE
MOTOR
SOV
4-20mA
PRESSURE
GENERAL

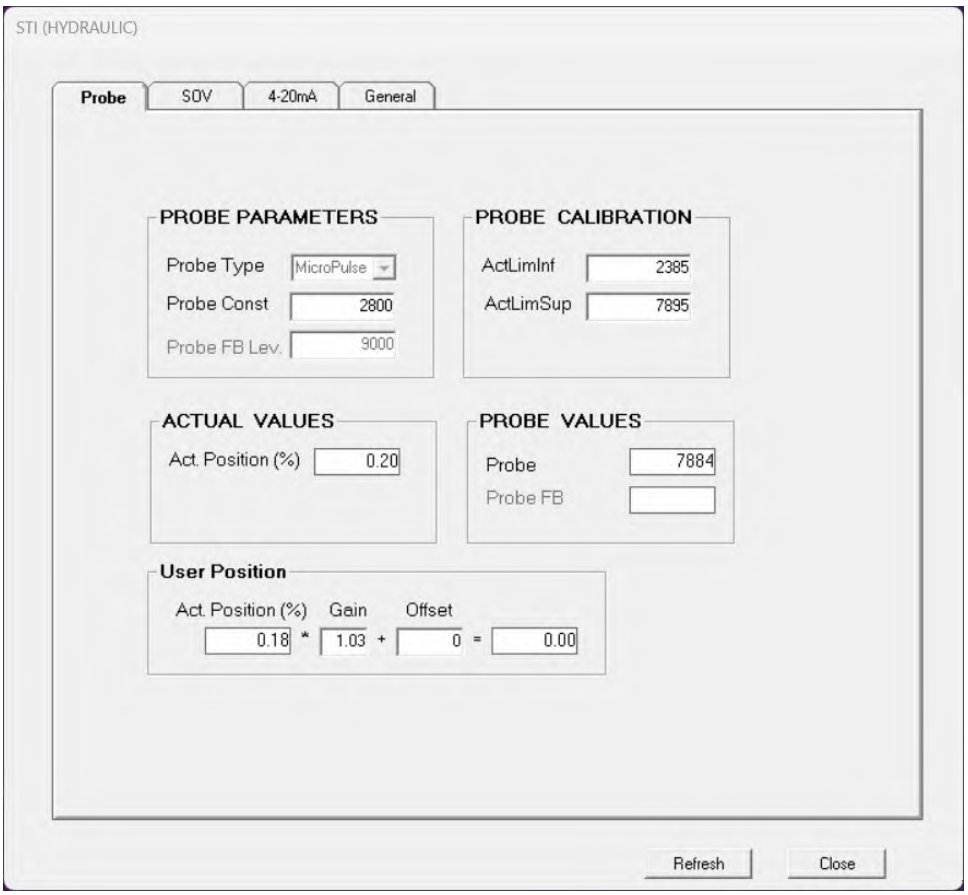
With the keys ↑ / ↓, it's possible to shift on the demanded line, and pushing the OK button, it's possible to activate or change the selected option.

On PC software to access to ***STI MENU*** is necessary to log in as "advanced user" (password level 2) inserting the advanced level password that is **23456** by default.



At the end of the login phase, the STI button will appear on the screen:

On the PC, pushing the STI button, the following page is displayed:



It contains the advanced configuration parameters, the calibration data, some run-time information and the advanced function buttons divided on 6 different tags:

- Probe: probe configuration – probe settings – probe actual reading values
- SOV: Solenoid valve check – SOV manual control
- 4-20mA: Analog input A/D converter reading – Analog outputs D/A converter calibration
- General: New functions enable – Erase calibration – Reset device

3.12.1 PROBE

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
↓			**DIAGNOSTIC**
OK			**ADVANCED**
	OK		**PROBE**
		ESC	To return to menu

Selecting PROBE will be displayed the probe configuration page:

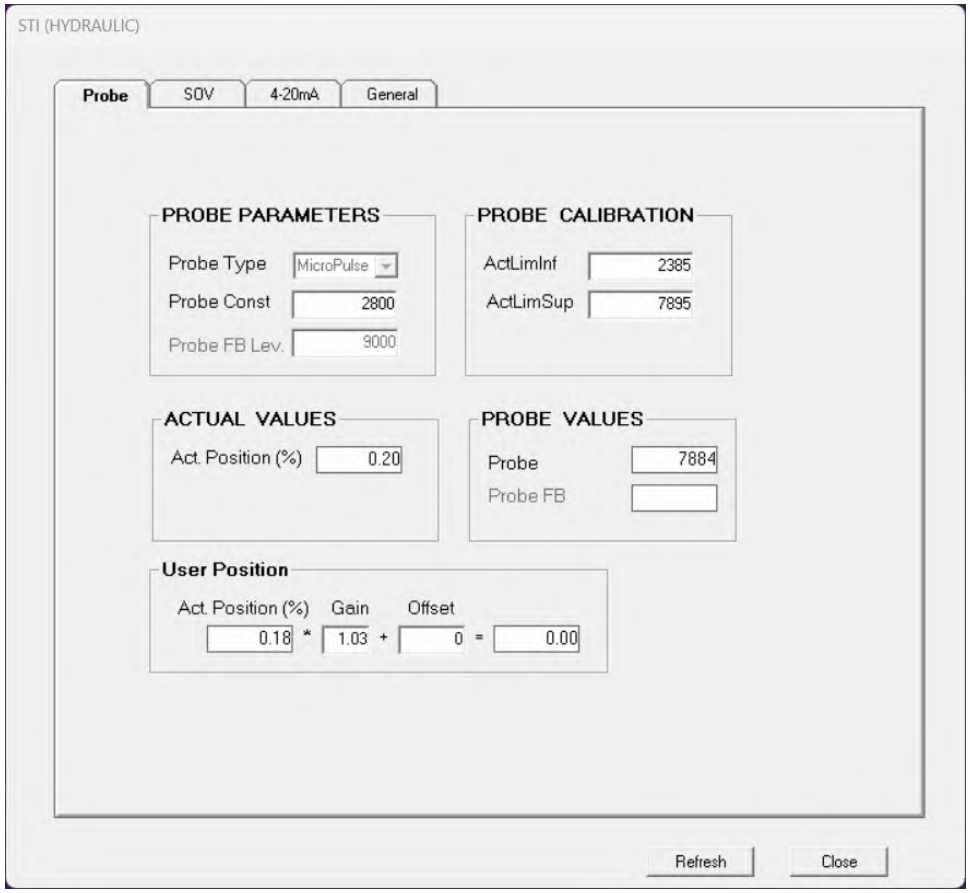
PROBE TYPE XXXXXX
PROBE CONST XXXX
PROBE FB LEVEL XXXX
ACTLIM INF XXXX
ACTLIM SUP XXXX

PROBE TYPE: With this command, it is possible to define the system probe selecting the line with the up / down buttons and scrolling the options by pushing the OK key. The available options are: MICROPULSE,4-20 mA, LVDT.

WARNING: QTIIIH supports only one probe type: MICROPULSE.
Please ensure that the selected probe type is MICROPULSE, as other types are not currently supported.

PROBE CONST: Allow to set the probe constant to have the right conversion between the probe reading value (Pulses) and the real stem movement value (millimetres or inches).
PROBE FB LEVEL: Shows the feedback level of the probe.
ACTLIM INF: Shows the probe reading lower limit found with the calibration.
ACTLIM SUP: Shows the probe reading upper limit found with the calibration.

On PC SW selecting the “Probe” label will be displayed:



Where are shown more information and functions
ACTUAL VALUES: is the position of the actuator expressed in %

PROBE VALUES: are the real time reading values related to probe signal

3.12.2 SOV

↓			MAIN
↓			SYSTEM INFO
↓			SYSTEM SET UP
↓			CALIBRATION
↓			COMMAND MODE
↓			FAIL & TRIP SETTING
↓			GENERAL SETTING
↓			SYSTEM DATA
↓			COMMUNICATION
↓			DIAGNOSTIC
OK			ADVANCED
	↓		PROBE
	↓		MOTOR
	OK		SOV
		ESC	To return to menu

From controller panel is possible to set only the SOV feedback.

SOV FEEDBACK XXXXXXX

On PC software is also possible to activate manually the solenoid valves using the command Force EV in manual control.

CAUTION: Forcing the solenoid valves may let the valve move unexpectedly.
The plant operator has the responsibility to make sure that the process valve, will not cause any damage to property or personnel before issuing the "FORCE EV" command.

	This includes making sure that personnel and equipment are clear of moving parts of the cylinder and process valve and that the plant process has been made safe by bypassing the process valve.

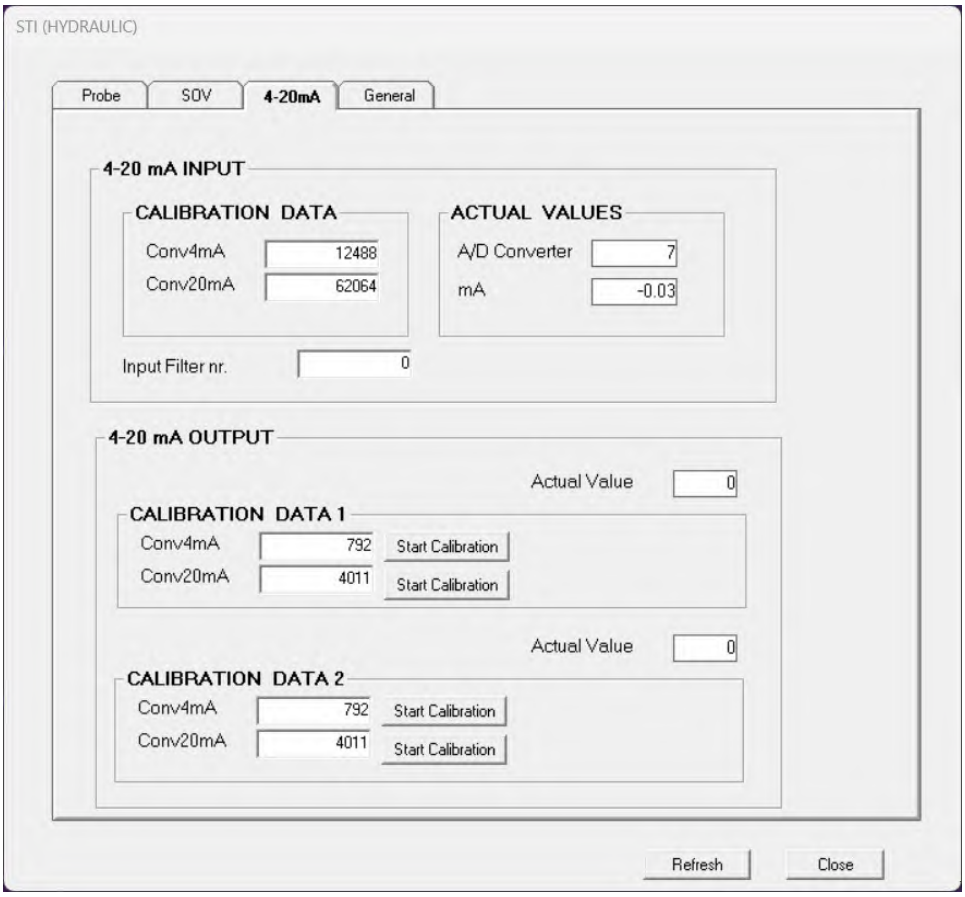
3.12.3 4-20 mA

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
↓			**DIAGNOSTIC**
OK			**ADVANCED**
	↓		**PROBE**
	↓		**MOTOR**
	↓		**SOV**
	OK		**4-20mA**
		ESC	To return to menu

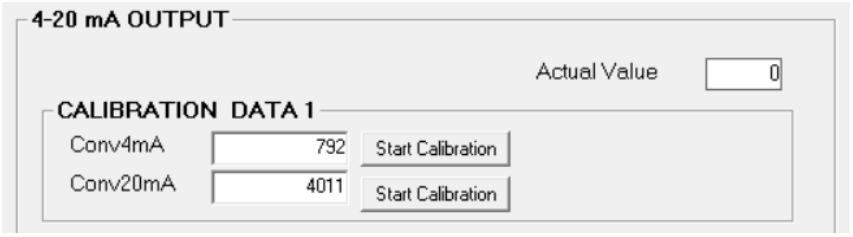
With this command, it is possible to see the 4-20 mA values.

INP CONV4mA XXXXX
INP CONV20mA XXXXX
OUT1 CONV4mA XXXXX
OUT1 CONV20mA XXXXX
OUT2 CONV4mA XXXXX
OUT2 CONV20mA XXXXX

From remote control software, it is possible to read the values of input analog to digital converter and calibrate the analog outputs.



To calibrate the outputs is necessary to connect the measuring instrument to the related output and press the start calibration button, read the output value on the instrument and modify the output clicking on – or + buttons. Once found the right value push Confirm. Cancel to abort the calibration.



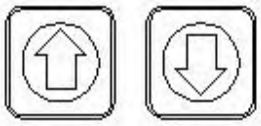
3.12.4 GENERAL

↓			**MAIN**
↓			**SYSTEM INFO**
↓			**SYSTEM SET UP**
↓			**CALIBRATION**
↓			**COMMAND MODE**
↓			**FAIL & TRIP SETTING**
↓			**GENERAL SETTING**
↓			**SYSTEM DATA**
↓			**COMMUNICATION**
↓			**DIAGNOSTIC**
OK			**ADVANCED**
	↓		**PROBE**
	↓		**MOTOR (PNEU)**

	↓		**SOV**
	↓		4-20mA
	↓		PRESSURE **(PNEU)**
	OK		GENERAL
		ESC	To return to menu

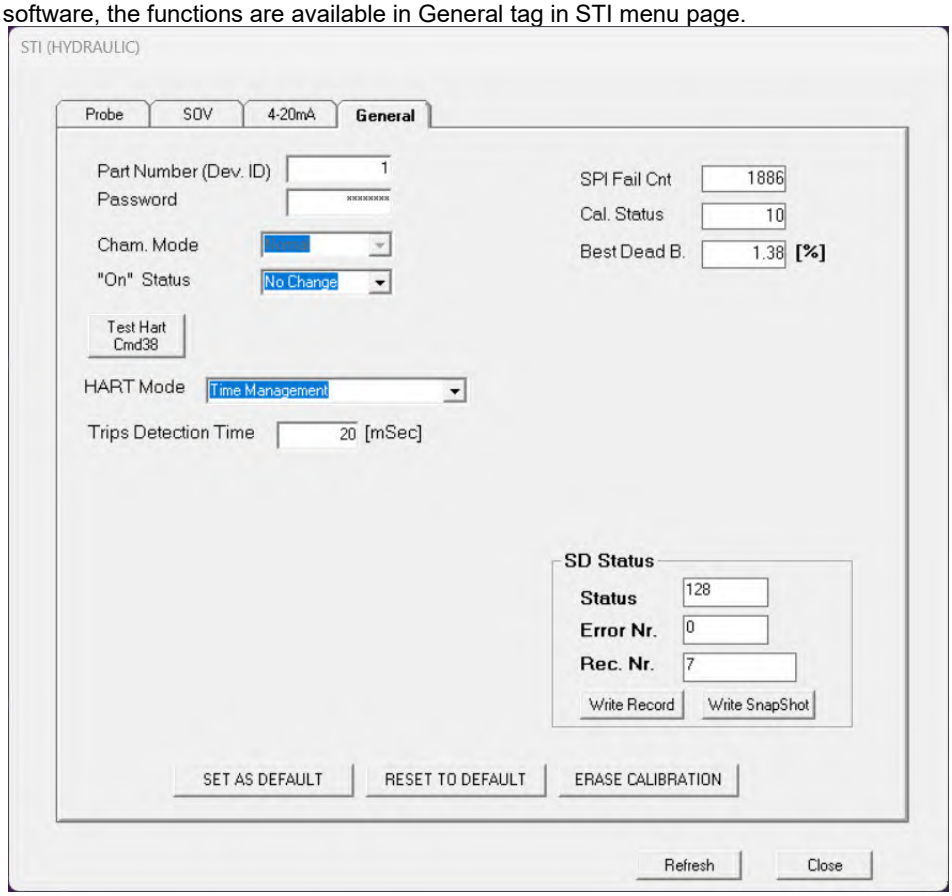
With this command, it is possible to enter the General setting menu:

PART NUMBER XX
PASSWORD
CHAM MODE XXXXX
FULL SPEED XXXXX
ON MODE XXXXX
P1-P3



SET AS DEFAULT
ERASE CALIB
RESET STAT&LOG
STAT DEBUG
HART DEBUG

On PC software, the functions are available in General tag in STI menu page.



3.12.4.1 PART NUMBER

With this command, it is possible to modify the QuickTrak IIIH (Hydraulic) part number, in a range of 1÷32767.
In the HART Protocol this number corresponds to the Device ID.

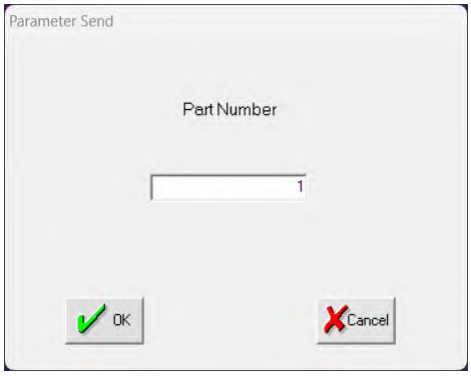
The following page is displayed:

PART NUMBER
1
PRESS OK TO CONFIRM

In this page with the 4 keys enabled, it's possible:

- to change the proposed value increasing it with the STEM □ and decreasing it with the STEM □;
- to cancel the possible changes and return to the Advanced submenu with the ESC key;
- to confirm the inserted value by pressing OK.

To change the parameter from PC software from the STI menu double click on parameter and type the new value.



To set the value, double click on the corresponding cell, input the value and press "OK" to confirm it or "Cancel" to exit from the input window.

3.12.4.2 PASSWORD

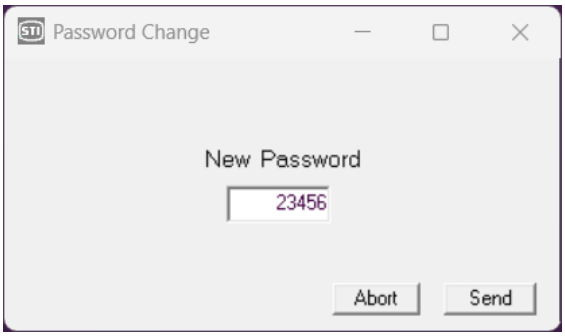
With this selection, it's possible to change the advanced level password.

The following page is displayed:

PASSWORD: _ _ _ _ _
CONFIRM: _ _ _ _ _

A sequence of 5 push buttons is required to define this password, used to enter the advanced menu from the local panel (the device is supplied by the manufacturer with the default advanced password [OK ↑ ↓ ↑ OK]).

This function is available on PC software from the STI menu.



To set the value, double click on the corresponding cell, input the value and press “SEND” to confirm it or “ABORT” to exit from the input window.

3.12.4.3 CHAMBER MODE

This function is related at the piping of the actuator. It is auto defined during the Calibration

3.12.4.4 FULL SPEED

Starting from DSP release 4.01 is available the FULL SPEED mode. This function has been inserted in order to increase the performance of the actuator on full stroke movement. When the actuator position is on a limit (0% or 100%) and a full stroke is requested the positioner full pressurize the related chamber bypassing all the tuning parameter.
Different settings are available

- Not enabled
- Stem in only
- Stem out only
- Both direction

On PC software is possible to set the function clicking the needed function

3.12.4.5 ON MODE

Starting from DSP release 4.01 is available the ON MODE function.
This option allows to select the status on power up. Is possible to choose between three parameters:

- NO CHANGE
- OUT OF SERVICE
- IN SERVICE

NO CHANGE: on power up the last status before the switch off is maintained
OUT OF SERVICE: on power up the service status will be set in OUT OF SERVICE mode
SERVICE: on power up the service status will be set in IN SERVICE mode

On PC software just select one of the needed functions:

3.12.4.6 SET AS DEFAULT

All the actual parameters set on positioner will be saved in internal memory as default.

3.12.4.7 ERASE CALIBRATION

With this function is possible to erase the calibration data.

3.12.4.8 RESET STAT&LOG

Allows to erase the statistics and event log file.

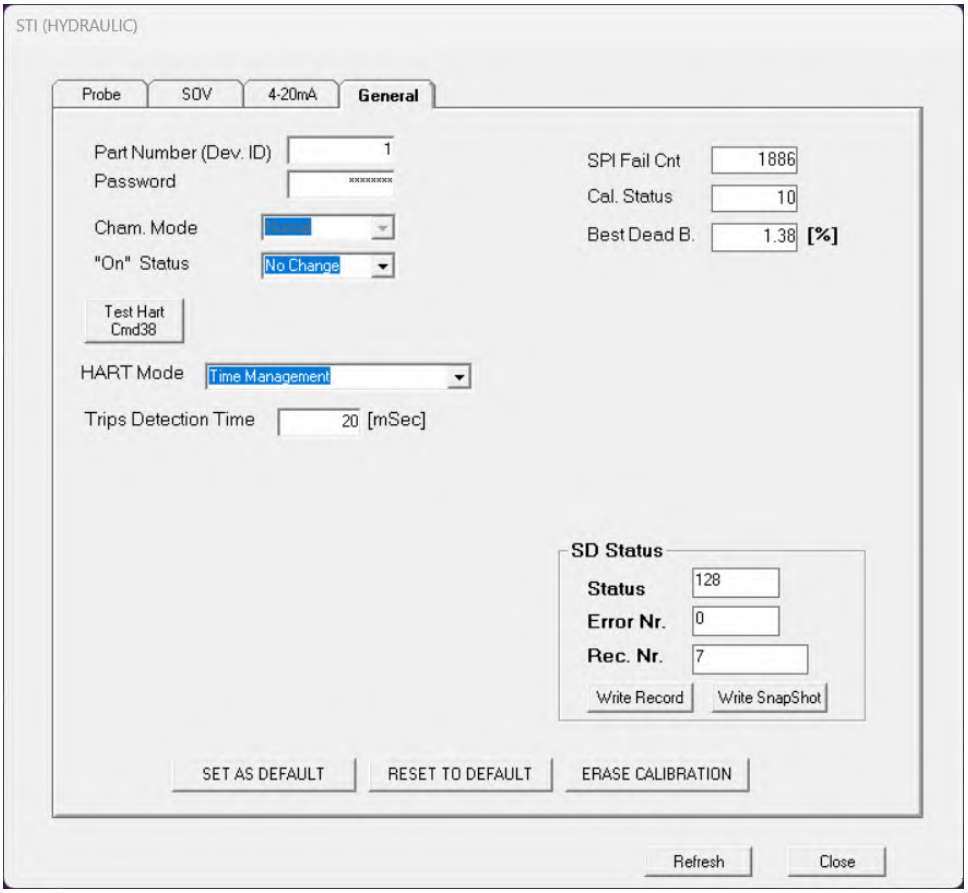
3.12.4.9 STAT DEBUG

Reserved debug page containing information about the statistical calculation and the recording time in External EEPROM.

3.12.4.10 HART DEBUG

Reserved debug page containing information about the input/output HART frames.

3.12.5 REMOTE CONTROL SW >>> STI PAGE >>> GENERAL TAG



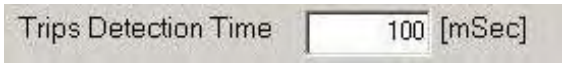
3.12.5.1 ON STATUS

This option allows to select the status on power up. Is possible to choose between three parameters:

- NO CHANGE
- OUT OF SERVICE
- IN SERVICE

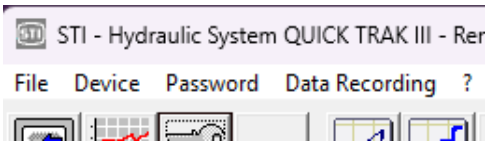
NO CHANGE: on power up the last status before the switch off is maintained
OUT OF SERVICE: on power up the service status will be set in OUT OF SERVICE mode
SERVICE: on power up the service status will be set in IN SERVICE mode

3.12.5.2 TRIPS DETECTION TIME



This function allows to set a delay time on the detection of the error condition due to a trip signal

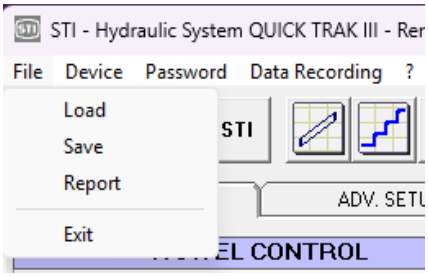
3.13 REMOTE CONTROL SW >>> TOOLBAR OPTIONS



From software toolbar is possible to select different functions contained in menus:

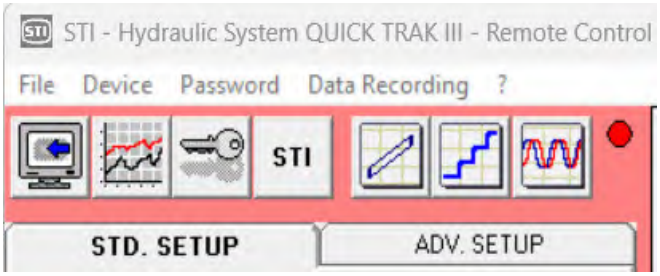
- File
- Device
- Password
- Data recording

3.13.1 FILE MENU



The available functions are:

- **Load:** allows to load a saved parameter file

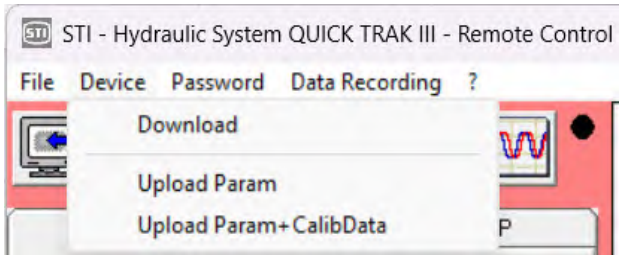


Once load a file the background of the program window changes colour.

- **Save:** saves the on-line parameters. The extension of the file is **.qtp**

- **Report:** creates a text file with all the positioner parameters
- **Exit:** close the program

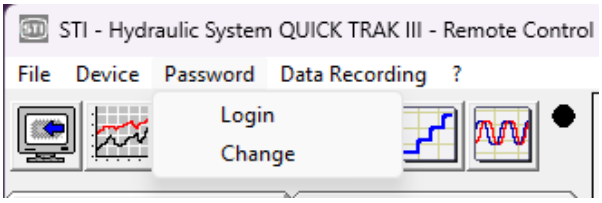
3.13.2 DEVICE MENU



In this menu the available options are

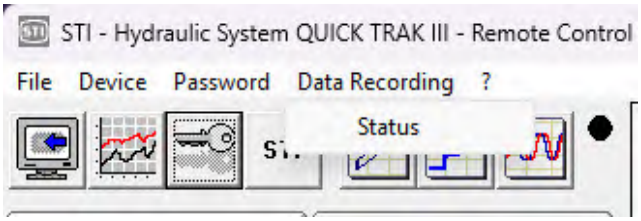
- **Download:** read the parameters from the positioner
- **Upload Param:** this function is available starting from password level 1 and it allows to send form the PC to the positioner the configuration data loaded from a file (backup file)
- **Upload Param + CalibData:** This function is available with password level 2 and it allows to send from the PC to the positioner the configuration data and the calibration data loaded from a file. *NOTE: it is ever suggested upload ONLY the parameters and perform an auto-calibration*

3.13.3 PASSWORD MENU



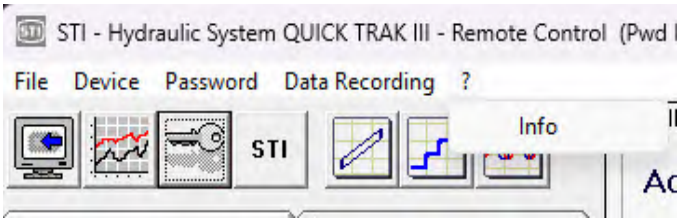
- **Login:** Used to login into the sw. Password level1: 12345 Password level2: 23456
- **Change:** allows to change the password

3.13.4 DATA RECORDING MENU

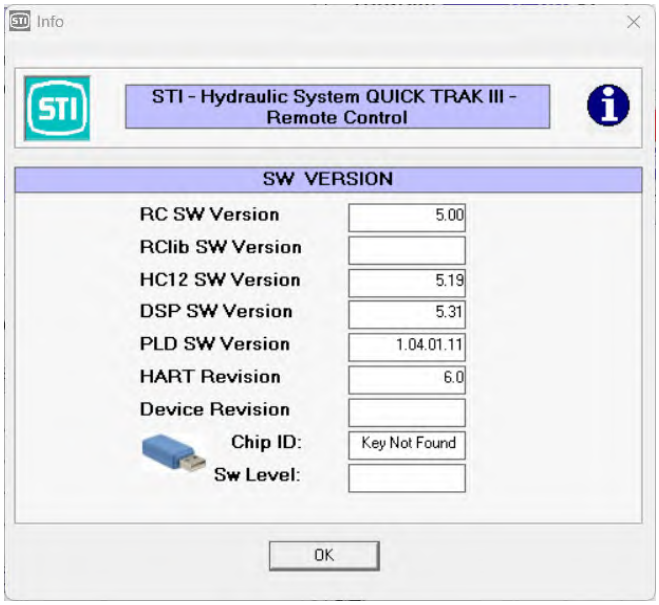


Allows to save on pc a log file.

3.13.5 INFO MENU



Selecting info menu is possible to display the release of the positioner.


Info
STI - Hydraulic System QUICK TRAK III - Remote Control
SW VERSION
RC SW Version
5.00
RClib SW Version
HC12 SW Version
5.19
DSP SW Version
5.31
PLD SW Version
1.04.01.11
HART Revision
6.0
Device Revision
Chip ID:
Key Not Found
Sw Level:
OK

4 GRAPH

This feature allows user to record set point and position signal waveforms for 10 seconds. Moreover, it comes with some tools to analyze the acquired waveforms. This feature is available just on the “Remotectrl” program.
To enable this feature, user must put the system into MANUAL mode. Open the Graph window clicking the GRAPH button on the remote control panel.

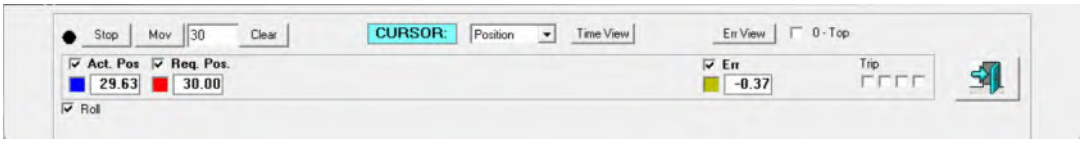
Below a detailed description of the available GRAPH tools:

The GRAPH tool allows to check the performances of all actuator parameters.

Selecting the options in the lower area of the GRAPH is possible to select the options that must be shown.

The available options are:
Act. Position: Is the actual position
Req. Position: Is the request position
Err: Difference between ReqPos and ActPos.
Trip: Shows Trips 1,2,3,4 (selecting from left to right)

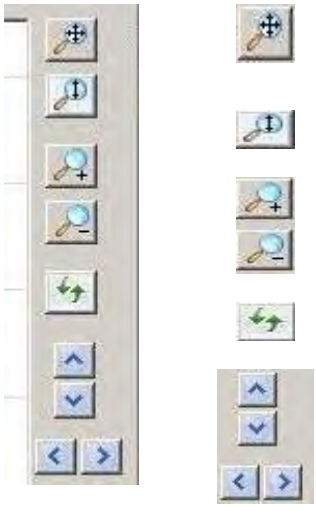
Once selected the graph options is necessary to press the “Start” button to start the monitoring of the parameters. The default scanning time is 30 seconds but using the “Roll” option (located under start button) the scanning will not stop until the closing of graph page or removing the Roll flag.



To deep analyze the performances of the actuator are available some functions to check easily the parameters.
Cursor position: Moving the cross cursor on the graph area is possible to read the cursor position (Y,X) in the yellow area named “CURSOR”.
Delta measuring: Is possible to measure the distance between two points on the graph. Move the cross cursor on the first point, push and hold the right mouse button, move the cursor on the second point and release the right button. In DELTA yellow area will be possible to read the last sampling. While holding the button a line appears to identify the measuring delta.
Mov button (manual movement): When the service status is in MANUAL mode is possible to move the actuator directly from the graph. Insert the desired position in the MOV area (near the button) and click on MOV button.

Clear button: allows to clean the screen.

Zoom function: selecting an area on the graph is possible to zoom in. To do it move the cross cursor on the left- top corner of the desired area to zoom in, push and hold the left button, move the mouse to the right-down corner of the area. While holding the button a box appears to identify the zoom area. On the left-top corner of the graph area are available further zoom tools



Zoom all: full scale zoom

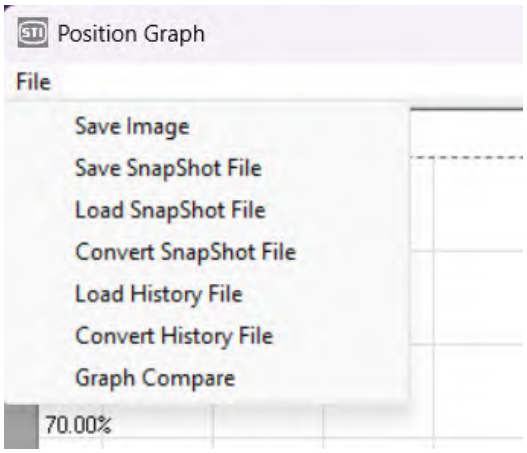
Zoom Y axis: full scale zooms on Y axis, X axis remains the selected

Zoom in – Zoom out

Refresh graph data

Scroll buttons: Allow to scroll the graph in each direction, is also possible to use the arrow keys on keyboard

In graph page it is possible also to use the file function



The options available are:

- **Save Image:** saves the actual measuring screen as bitmap image
- **Save Snapshot File:** saves the actual measuring screen as binary file (.bin extension). Into the file are saved all the actuator parameters.
- **Load Snapshot File**: load a stored binary file. Once loaded the file is possible to full analyze the graph (show or hide parameters, zoom, measure) like in on-line graph
- **Convert Snapshot File:** convert the snapshot binary file in a .csv file (excel extension)
- **Load History File:** Load an history file stored in the SD CARD (SEE RELATED CHAPTER) . Opening the file is possible to select the portion of the historical file to be displayed
- **Convert History File:** Convert the history file stored in SD CARD in a .csv file.
- **Graph Compare:** Compare two saved graphs.

5 TROUBLE SHOOTING

Problem description	Cause	Solution
The controller doesn't switch on	• The power is not connected • The power supply voltage is out of the admissible range (+/-10%) • The main power switch inside the controller is OFF • The fuses are blown • Some wiring is not properly done either inside the controller or in the step motor enclosure • There is a short circuit on some of the devices connected to the controller	• Connect the power • Check the power supply voltage value with a multimeter • Switch on the main power switch • Replace the fuses • Check the wiring using the electrical diagram and that the connector to step motor, encoder and pressure transducers is properly plugged. • Disconnect all the terminal boards connected to these device and check whether the controller switches on.
Probe error E10	• Some wiring is not properly done • The software selection in STI menu of the used probe is not correct • The probe has been calibrated with a shorter stroke process valve • The probe is damaged	• Check the wiring • Check that the software setting corresponds to the used probe • Erase the previous calibration and perform a new calibration • Replace the probe
Red light flashing on motor-driver electronic board **(PNEU)**	• The step motor connector is not properly plugged • The wiring is not properly done • There is an excessive friction on the spool valve driven by the step motor	• Check the connector plug • Check the wiring • Check that the spool valve can slide smoothly and in STI menu the difference between step motor and encoder steps is not too big
A change in the valve position set point doesn't affect the actuator's position	• The air supply pressure value is too low • The spool valve is sticking • The parameters configuration is not correct • Actuator and/or jammed valve • Signal wires are not properly connected • Circuit boards are defective • Calibration and tuning have not been carried out • Device is in "manual" or "out of service" mode • Device is in fail safe status	• Check the air supply pressure value • Check that the spool valve can slide smoothly and in STI menu the difference between step motor and encoder steps is not too big • Check gain and dead band values • Check that the actuator can move in a continuous way and not in steps • Check signal wires • Replace circuit boards • Perform a calibration and make the proper tuning • Set the system in "in service" mode • Check whether the solenoid valve making the fail-safe mode is energized
Overshooting or positioning too slow	• Incorrect tuning in terms of dead band and gain • The spool valve is sticking • Too small air tubing or dirty air filter • Leakages in air tubing and manifold connections • Process valve is sticking	• Change the dead band and gain values • Check that the spool valve can slide smoothly and in STI menu the difference between step motor and encoder steps is not too big • Check air tubing size with the factory and inspect air filter • Check leakages in air tubing and manifold connections • Check process valve
E05 **(PNEU)**	Pressure fail	• Check air supply line

		• Check that the air filter regulator is properly set • Check that the wiring to air supply pressure transducer
E06	Low signal fail limit	• Check that the signal wires are properly connected to the terminal board • Check with a multimeter the value of the signal • Check that the internal flat cables between the two terminal boards are properly connected
E07	High signal fail limit	• Check that the signal wires are properly connected to the terminal board • Check with a multimeter the value of the signal • Check that the internal flat cables between the two terminal boards are properly connected
E08	Position excess error	See point 4. of this table
E09	Position excess warning	See point 4. of this table
E10	Probe error	Check wiring connection. Control if the connector is properly connected, and check probe supply.
E11	Low power fail	• Check that the power wires are properly connected to the terminal board • Check with a multimeter the value of the power supply • Check that the fuses are not blown
E12	Hard limits error	• Check the probe is working properly • Check that the air supply value is not too low
E13	DSP timeout	Replace the display electronic board
E14	Watch dog error	Replace the display electronic board
E15	High power fail	• Check that the power wires are properly connected to the terminal board • Check with a multimeter the value of the power supply
E16	Error on solenoid valve SOV1	• Check that the solenoid valve's coil is not burnt • Check the wiring between the solenoid valve and the controller if the solenoid valve is supposed to be energized check that the yellow light on the side of the SOV1 connector is ON.
E17	Error on solenoid valve SOV2	• Check that the solenoid valve's coil is not burnt • Check the wiring between the solenoid valve and the controller if the solenoid valve is supposed to be energized check that the yellow light on the side of the SOV2 connector is ON.

E18	Error on solenoid valve SOV3	• Check that the solenoid valve's coil is not burnt • Check the wiring between the solenoid valve and the controller • If the solenoid valve is supposed to be energized check that the yellow light on the side of the SOV3 connector is ON.
E19	DSP restart	• Restart again the controller and check whether the error is cleared • Replace the display electronic board
E20	Calibration erased	• This is a warning message used to inform that a calibration parameters reset has been performed by the operator
E21	EEprom Error 0	• If the controller is locked, try to restart. If the problem remains change the display electronic board
E22	EEprom Error 1	• If the controller is locked, try to restart. If the problem remains change the display electronic board
E23	HC12 Restart	• Restart again the controller and check whether the error is cleared • Check the power supply cable of display board • Replace the display electronic board
E24	EEprom Ext Error 0	• If the controller is locked, try to restart. If the problem remains change the display electronic board
E 25	EEprom Ext Error 1	• If the controller is locked, try to restart. If the problem remains change the display electronic board
E26	Probe Out of Range	• Check the stoke length and perform a new calibration
E31	Calibration aborted	• During the calibration something aborted the process. Fix the problem and perform a new calibration
E32 **(PNEU)**	Zero spool error	• Check if the spool is free to move on all length
E33 **(PNEU)**	Zero spool searching	• Warning message. Second try to find the zero spool during start-up
E34 **(PNEU)**	Spool limit Error	• Check if the spool is free to move on all length
E35 **(PNEU)**	Friction warning	• Warning message related to the spool movement
E36 **(PNEU)**	Encoder Error	• Check if the motor move • Check if the encoder is correctly fixed on the motor • Check the motor and encoder wirings
E37 **(PNEU)**	Friction Error	• Check if the motor move • Check if the spool can move free on all length • Check if the encoder is correctly

		fixed on the motor • Check the motor and encoder wirings • Check the motor steps and encoder signal
E38 **(PNEU)**	Encoder Index Error	• Check if the spool is free to move. Perform a new calibration
E39 **(PNEU)**	Encoder Index2 Error	• Check if the spool is free to move. Perform a new calibration
E41	Wait ack	• Waiting for acknowledge after an error condition with end mode set to “Wait ack”
E42	External Solenoid	• A trip signal is detected on an input configured as “External solenoid”
E43	System Version	• Check the DSP and HC12 version • Update the firmware version

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INSTRUCTION MANUAL
DPS (DIGITAL POSITION SYSTEM)
QT series (motor)

INDEX

1		**General prescription**	**1**
	1.1	Manufacturer's identification data	1
	1.2	General safety instructions	2
		1.2.1 Installation	2
		1.2.2 Maintenance	3
2		**General features**	**4**
3		**Mounting procedure**	**5**
4		**Maintenance operation**	**5**

1 GENERAL PRESCRIPTIONS

It is strongly recommended that this entire manual be read before attempting to install and operate the system.

1.1 MANUFACTURER'S IDENTIFICATION DATA

Every explosion proof step-motor enclosure mod. DPS is provided with a name plate with its serial number. The year of manufacturing is indicated by the first two numbers of the serial number.

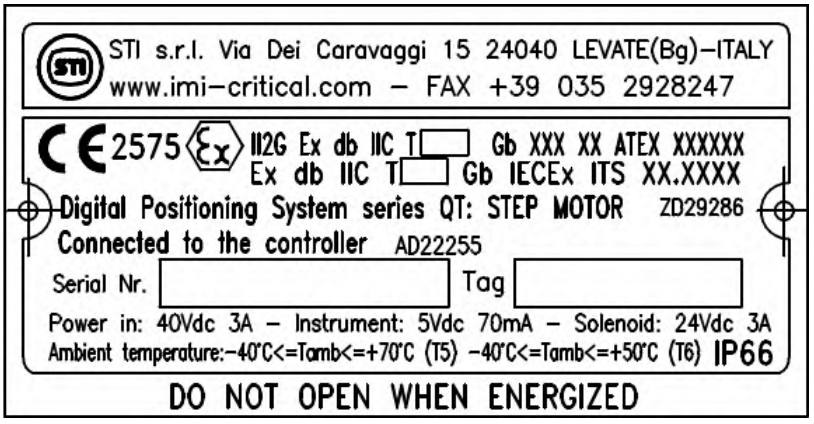

fig. 1 - Sample of equipment label

Manufacturing year is indicated by the two first digit number of the serial number.

Do not remove it and/or replace with other name plates.

The step-motor enclosure mod. DPS, in its explosion proof version, is designed to operate in potentially explosive atmosphere ATEX/IECEX classified as:

Ex II 2 G Ex db IIC Tx Gb
Ex db IIC Tx Gb

Equipment group II surface industry, category 2 for use in zone 1 with explosive atmospheres caused by gases, vapours or mists and in conformity to types of protection standardized EN60079-0 and IEC60079-0 with flameproof enclosure EN60079-1 and IEC60079-1 for hydrogen and acetylene (temperature class maximum 85°C).

Range of the permissible ambient temperature are:
-40°÷ 50°C for T6
-40°÷ 70°C for T5

1.2 GENERAL SAFETY INSTRUCTIONS

The non-observation of the following safety instruction and of the instruction manuals brings with it danger of explosions with serious injury or operator death.

1.2.1 Installation

- Must be done by qualified person trained to operate into potentially explosive atmosphere.
- An external ground connection is mandatory, the section of the conductor must be chosen in accordance to EN60079-0 and IEC60079-0 (a M5 screw is available for the connection).

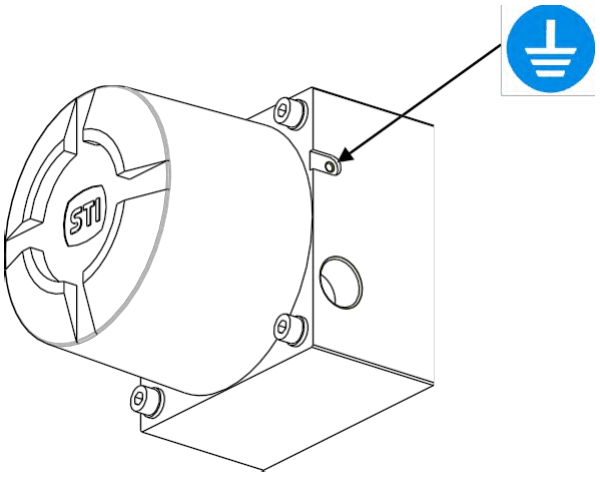

fig. 2 - External ground connection

- The electrical and pneumatic connections must be done according to the diagram and label.
- The supply circuit must be protected in case of current exceeding the limit fixed.
- The equipment must be provided with cable entries and filler plugs certified according to the Directive 2014/34/EU, EN60079-0, IEC60079-0, EN60079-1 and IEC60079-1 for category 2G.
- The internal ground connection is mandatory, the section of the conductor must be chosen in accordance to EN60079-0 and IEC60079-0 (a M5 screw is available for the connection).

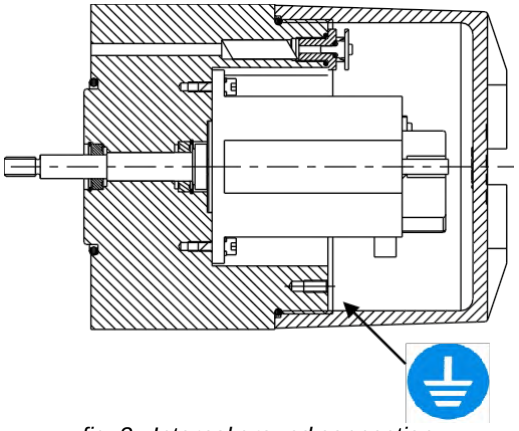

fig. 3 - Internal ground connection

- The actuator must be installed and used according to the project design specification.
- The fluid must be chemically compatible with the used gaskets and lubricant.
- The step motor must be used through the enclosed supplied controller STI ref. AD22255 (and relevant driver TRINAMIC model TMCM-035).
- The supply circuits must be protected in case of current exceeding the limits fixed The user has to ensure prior to start up and during operation that the pressure transducers are correctly fixed inside the enclosure all the time.
- The rated values for pressure transducer must be guarantee.
- Pressure range of the medium has to be between 0.8 to 1.1 bar. Outside of this condition the approval on which this manual is based is only a guide.

1.2.2 Maintenance

- Must be done by qualified person who is trained to operate into potentially explosive atmosphere.
- Tools and equipment must be suitable for potentially explosive atmosphere where the actuator is installed.
- Cleaning must be done with a humid cloth.
- Greases and oils must be used according to the manufacturer's instructions, however their flammability point must be > 140°C.

- "Specific Conditions of Use" / "Schedule of Limitations": Specific guidance noted to contact the original manufacturer for information on the dimensions of the flameproof joints.

Do not remove the cylindrical joints before start up and during operation it must be ensured that all the three pressure transducers are correctly fixed inside the enclosure pos. 16 fig. 4 for any reason otherwise the flame proof gap is compromised.

2. GENERAL FEATURES

The step-motor enclosure mod. DPS™III is composed by an enclosure in which a step-motor and 3 pressure transducers are installed and a cover. On the step-motor's shaft an extension shaft equipped with 2 rolling bearing is fitted.
O-ring gaskets between the enclosure and the cover and between the enclosure and the support columns are used in order to guarantee the protection degree of the enclosure.

TECHNICAL FEATURES	
This device meets requirements for CE conformity certification (CEI EN55022, CEI EN 50082-2)	
Ambient temperature : ……..…	T5 = -40° to +70°C T6 = -40° to +50°C
Step-motor electrical input parameters (with driver control): …… (POWERMAXII series M22NxxB)	- I_s (dc): 1.5A - V_s (dc): 40V
Step-motor mechanical output: ……..	1 (360°) actuation/sec
Pressure transducer electrical / pneumatic features: ……..… (FUJIKURA model XFGM-3001MPGSR)	- I_{max} (dc): 10 mA - V_{max} (dc): 5V - P_{range}: 0÷10 bar
Encoder supply voltage :…….……..……..……..	5V
Driver electrical input parameters: ……..… (TRINAMIC model TMCM-035)	- V_o (dc): 40V - I_o (dc): 3A
Conduit entries : ……..…...	N°4 holes 3/4" NPT F Cable entries tolerances according to ANSI/ASME B1.20.1

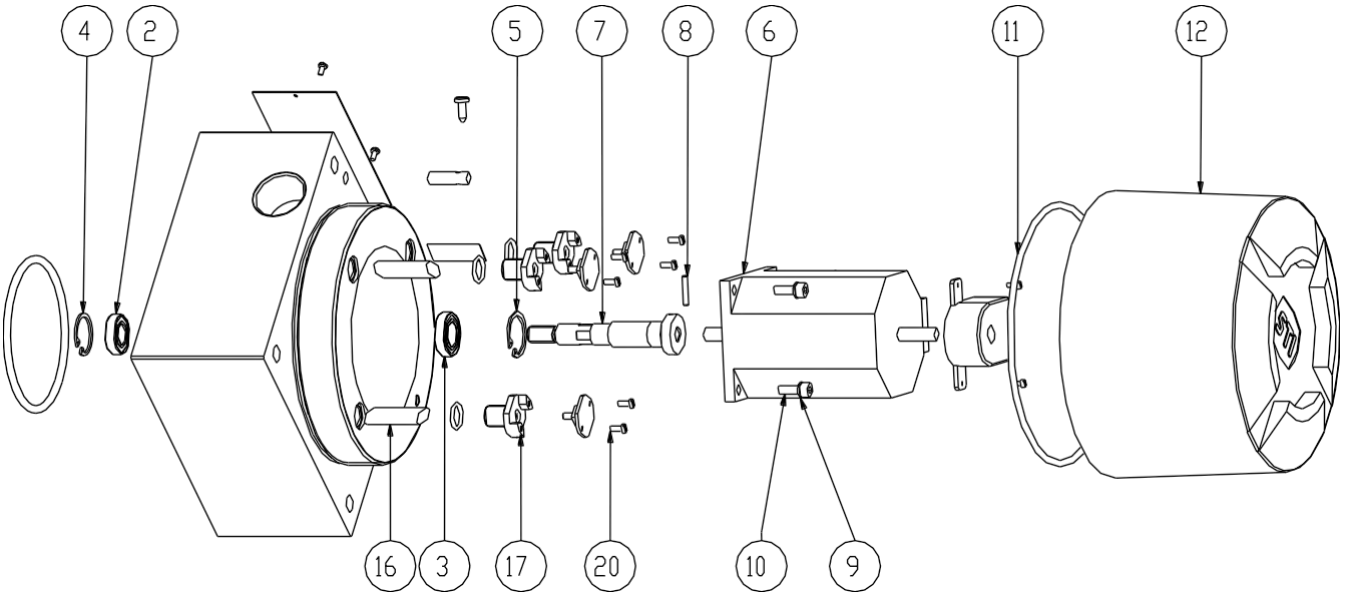

fig. 4 – Motor enclosure components

MATERIAL	
Housing:	EN AW 2011 T6 EN573-3
Cover [12]:	A356-T6
Shaft extension [7] :	X5CrNi 18 10 EN10088-3(ANSI304)
Rolling bearing [3-2]:	Stainless steel
Column supports for pressure transducers [17]:	EN AW 2011 T6 EN573-3
Flameproof joint [16]	X5CrNi 18 10 EN10088-3(ANSI304)

3. MOUNTING PROCEDURE

The step-motor is supplied with a stem extension pos.7 connected by a pin pos. 8 to its shaft:

Do not remove the pin pos. 8 for any reason.

For mounting or dismounting operation, follow these instructions (see above picture):

- mount rolling bearing pos. 2 in its appropriate seat and then clip pos. 4;
- mount rolling bearing pos. 3 in its appropriate seat and then clip pos. 5;
- insert step-motor pos. 6 inside the enclosure, taking care not to make an excessive axial force on the step-motor's shaft; fix the step-motor to the enclosure by the 4 screws pos. 9-10;
- insert N°3 flame proof joint pos. 16 inside the corresponding holes;
- mount N°3 O-rings and screw the pressure transducers support columns pos. 17 inside the corresponding holes;
- mount O-ring pos. 11;
- screw the cover pos. 12.

For the cables wiring refer to relevant electric diagram.

4. MAINTENANCE OPERATION

No maintenance operations are required on the stepping motor. In case of abnormal noise or malfunction contact STI.

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INSTRUCTION MANUAL
DPS (DIGITAL POSITION SYSTEM)
QT series (controller)

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1 GENERAL PRESCRIPTIONS

It is strongly recommended that this entire manual be read before attempting to install and operate the system.

1.1 MANUFACTURER'S IDENTIFICATION DATA

Every controller mod. DPS is provided with a name plate with its serial number. The year of manufacturing is indicated by the first two numbers of the serial number.

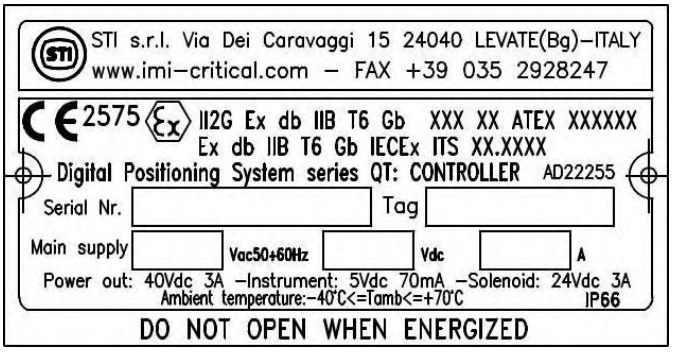


fig. 1 -Sample of equipment label

Do not remove it and/or replace with other name plates.

The controller mod. DPS, in its explosion proof version, is designed to operate in potentially explosive atmosphere ATEX/IECEX classified as:

Ex II 2 G Ex db IIB T6 Gb
Ex db IIB T6 Gb

Equipment group II surface industry, category 2 for use in zone 1 with explosive atmospheres caused by gases, vapours or mists and in conformity to types of protection standardized EN60079-0 and IEC60079-0 with flameproof enclosure EN60079-1.
Range of the permissible ambient temperature are: -40°÷ 70°C for T6.

1.2 GENERAL SAFETY INSTRUCTIONS

The non-observation of the following safety instruction and of the instruction manuals brings with it danger of explosions with serious injury or operator death.

1.2.1 INSTALLATION

- Must be done by qualified person who is trained to operate into potentially explosive atmosphere
- An external ground connection is mandatory, the section of the conductor must be chosen in accordance to EN60079-0 and IEC60079-0 (a M5 screw is available for the connection).

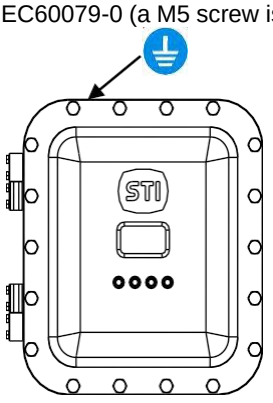


fig. 2 - External ground connection

- The electrical connections must be done according to the diagram and label.

- The equipment must be provided with cable entries and filler plugs certified according to the Directive 2014/34/EU, EN60079-0, IEC60079-0, EN60079-1 and IEC60079-1 for category 2G.
- The internal ground connection is mandatory, the section of the conductor must be chosen in accordance to EN60079-0 and IEC60079-0 (a M5 screw is available for the connection).
- The actuator must be installed and used according to the project design specification.
- The fluid must be chemically compatible with the used gaskets and lubricant.
- The supply circuits must be protected in case of current exceeding the limits fixed.

1.2.2 MAINTENANCE

- Must be done by qualified person who is trained to operate into potentially explosive atmosphere.
- Tools and equipment must be suitable for potentially explosive atmosphere where the actuator is installed.
- Cleaning must be done with a humid cloth.
- “Specific Conditions of Use” / “Schedule of Limitations”: Specific guidance noted to contact the original manufacturer for information on the dimensions of the flameproof joints.

2. GENERAL FEATURES

The controller mod. DPS is composed by an enclosure in which are housed a power supply, terminal blocks, display, local controls and a digital controller provides closed-loop control of valve position based upon input signal, valve position feedback, spool position feedback, and stepper-motor control. The Digital Controller can be mounted directly to the actuator or remote-mounted.
O-ring gaskets between the enclosure and the cover and between the enclosure and the support columns are used in order to guarantee the IP protection degree of the enclosure.

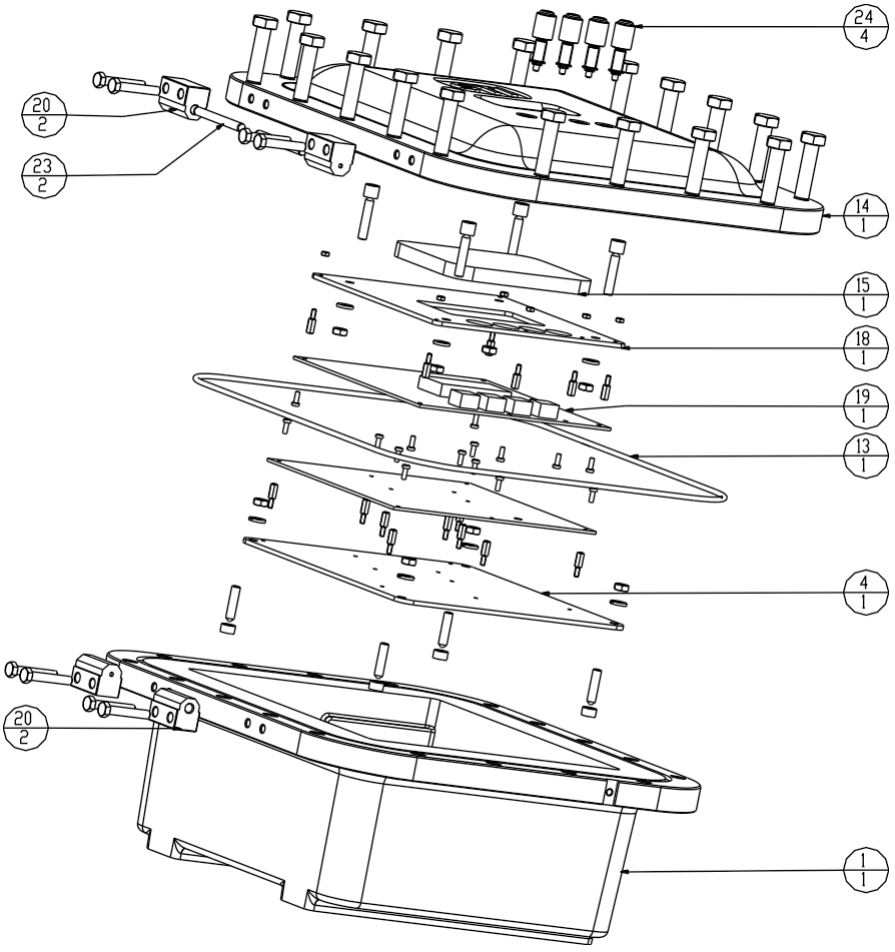


fig. 3 – Controller components

TECHNICAL FEATURES	
This device meets requirements for CE conformity certification. Basic technical specifications: CEI EN55022, CEI EN 50082-2.	
Input Signal / Position Feedback……	4-20 mA; Hart protocol
Ambient temperature : …….	T6 = -40° to +70°C
Maximum power consumption……..	P_o: 95W
Power supply:……..	From 100 to 240 Vac ±10% 50-60Hz ±5%
	From 24 to 145 Vdc ±10% (0.3 to 4A)
Conduit entries : …….	see relevant drawing

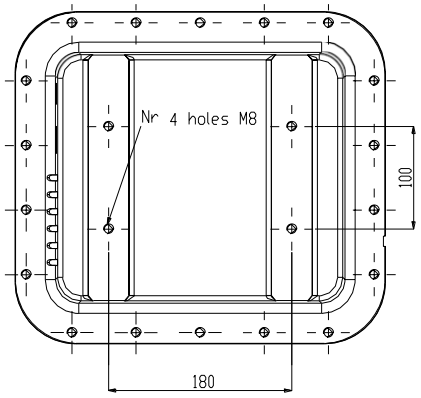
MATERIAL	
Housing [1] :	Aluminum G-AlSi 9 MnMg UNI3051 or ASTM A356-T6
Cover [14]:	Aluminum G-AlSi 9 MnMg UNI3051 or ASTM A356-T6
Hinghe [20] :	Aluminum 2011 UNI9002/5
Window [15] :	Glass
Push button [24] :	Aluminum 2011 UNI9002/5 or AISI 304
Support plate [4-18] :	AISI 303/304

3. MOUNTING PROCEDURE

CAUTION: The electrical and pneumatic connections must be done according to the diagram and label.

The controller enclosure is rated for IP66 environment. Outdoor mounting is acceptable, however, the controller should be protected from direct sunlight by a suitable shade (see temperature rating). For proper reading of the LCD screen, the controller should be mounted with the pushbuttons below the screen. The controller should be mounted securely to a sturdy mechanical surface using four screws in the enclosure mounting flange holes, with washers. See figure below for hole size and position. The structure, at the controller mounting location, should not be subjected to temperatures higher than the maximum ambient temperature described above.

WARNING: Additional holes on the enclosure not provided in the drawing PD21637 are not allowed, the non-observation brings with it danger of explosions with serious injury or operator death.



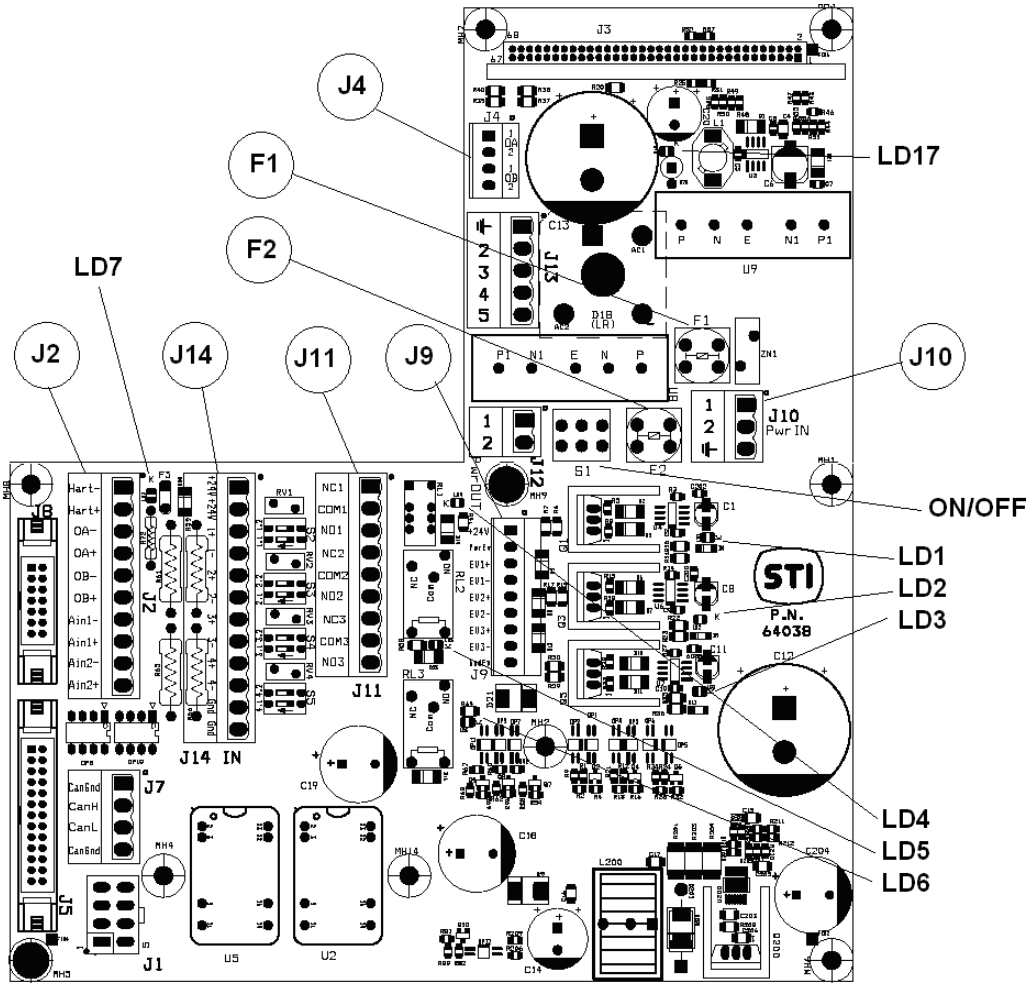
4. MAINTENANCE OPERATION

No maintenance operations are required on the controller.

WARNING: If the communications mode via RS-232 serial interface is required, be careful that the controller can be opened only when the unit is in a non hazardous environment.

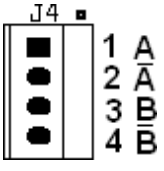
5 POWER BOARD CONNECTION

The connections to the power board terminals are made through screw-type terminal blocks on the printed circuit boards. The recommended torque for these screws is 4.5 lb-in / 0.5 Nm for all terminal boards (max wires section 2,5mm^2) except the terminal board J4 and J9 for which the recommended torque is 1.95 lb-in / 0.22Nm (max wires section 1,5mm^2).

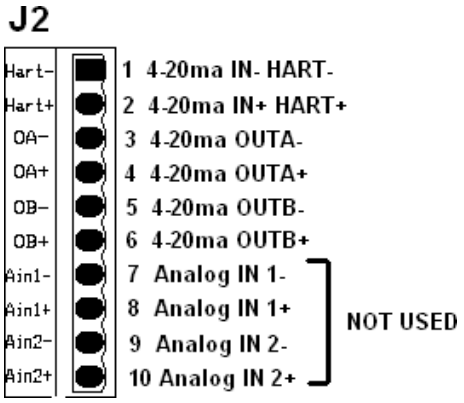


5.1 STEPPER MOTOR WIRING

J4 (already wired by the manufacturer) is the stepper motor connection (terminals 1-2-3-4).



5.2 INPUT AND OUTPUT SIGNAL WIRING



5.3 POSITION DEMAND : Pin 1,2

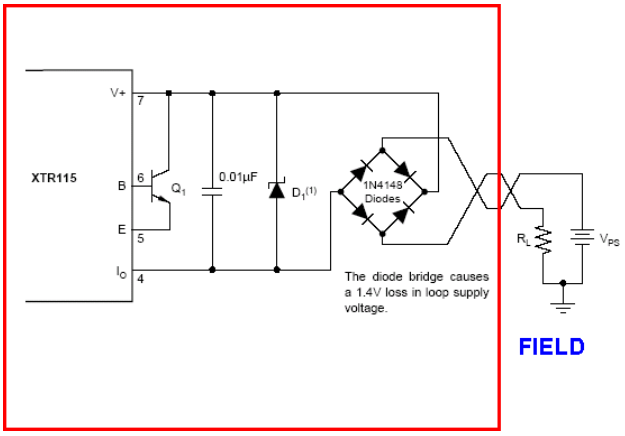
Input current, nominal	4-20ma
Input burden	475 Ω
Resolution	16 bit
Isolation Voltage	2500 V
HART revision	06

4-20ma input for position demand take power from an isolated source supplied from the controller

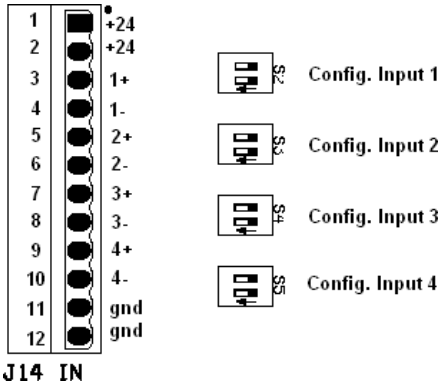
5.4 4-20mA OUTPUT : Pin 3,4 & 5,6

Isolation voltage	2500V
Output current (nominal)	4-20ma
Burden	750 Ω max (power supply = 24Vdc)
External power supply	24V (12..30V)
Resolution	12 bit

Each 4-20mA output must be powered from the field.

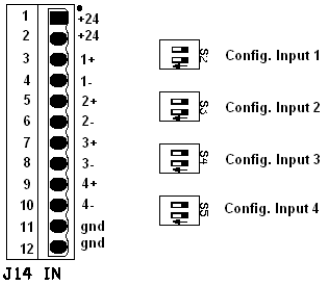


5.5 TRIP SIGNALS



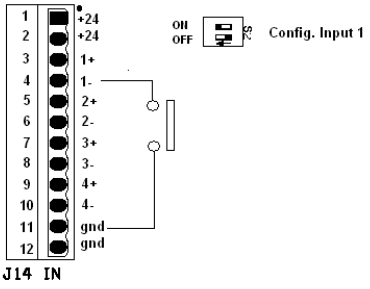
J14 Terminals are the input for trip signals.
Isolation voltage 2500V
Input type : Free contact or 24Vac or 24Vdc
The led LD1, LD2, LD3, LD4 mounted on the display board show the status of the trip signal.

5.6 CONFIGURATIONS AND CONNECTIONS OF TRIP SIGNAL

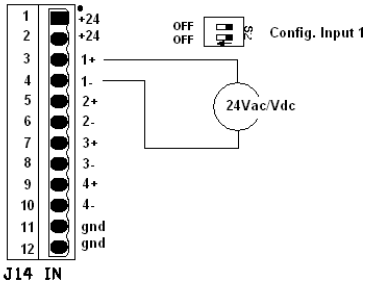


Examples (referred to TRIP1)

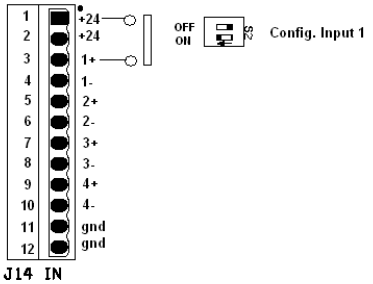
Configuration 1 : Free contact or NPN



Configuration 2 : 24Vac/Vdc

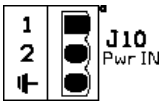


Configuration 3 : Free contact or PNP



5.7 SUPPLY WIRING

There are different adapters for AC and DC electrical power.



AC power : Standard available are 120 Vac and 240 Vac for alternate current power.

J10	
1	AC
2	AC
3	EARTH

DC power : Standard available are 24Vdc, 48Vdc, 110Vdc.

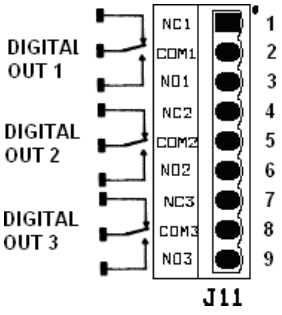
J10	
1	DC in +
2	DC in -
3	EARTH

5.8 FUSES

Supply / Fuse	F1	F2
120 Vac	800mA T	800mA T
240 Vac	400mA T	400mA T
24Vdc	5A T	5A T
48Vdc	2,5A T	2,5A T
110Vdc	2A T	2A T

When the led LD17 is ON, it shows that the electronic board is powered.

5.9 DIGITAL OUTPUT (J11)



5.10 DIGITAL OUT1

■ Contact Ratings

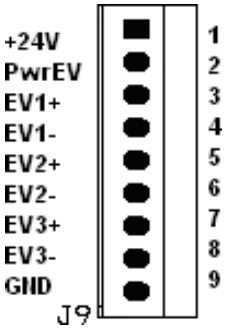
Load	Resistive load (cosφ = 1)
Rated load	0.5 A at 125 VAC; 2 A at 30 VDC
Contact material	Ag (Au-clad)
Rated carry current	2 A
Max. switching voltage	250 VAC, 220 VDC
Max. switching current	2 A
Max. switching power	62.5 VA, 60 W
Min. permissible load	10 μA at 10 mVDC

5.11 DIGITAL OUT2 &3

CONTACT DATA	
Contact arrangement	1A, 1C
Initial contact resistance Max.	100mΩ (at 1A 6VDC)
Contact material	See ordering info.
Contact rating (Res. load)	NO: 5A 250VAC/30VDC NC: 3A 250VAC/30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	5A
Max. switching power	1250VA / 150W

The led LD4, LD5, LD6 mounted on the power board show the status of the digital output 1, 2, 3 respectively.

5.12 SOLENOID VALVE SOV (J9)



5.13 3xON/OFF SOLENOID VALVE DRIVER CARACTHERISTICS

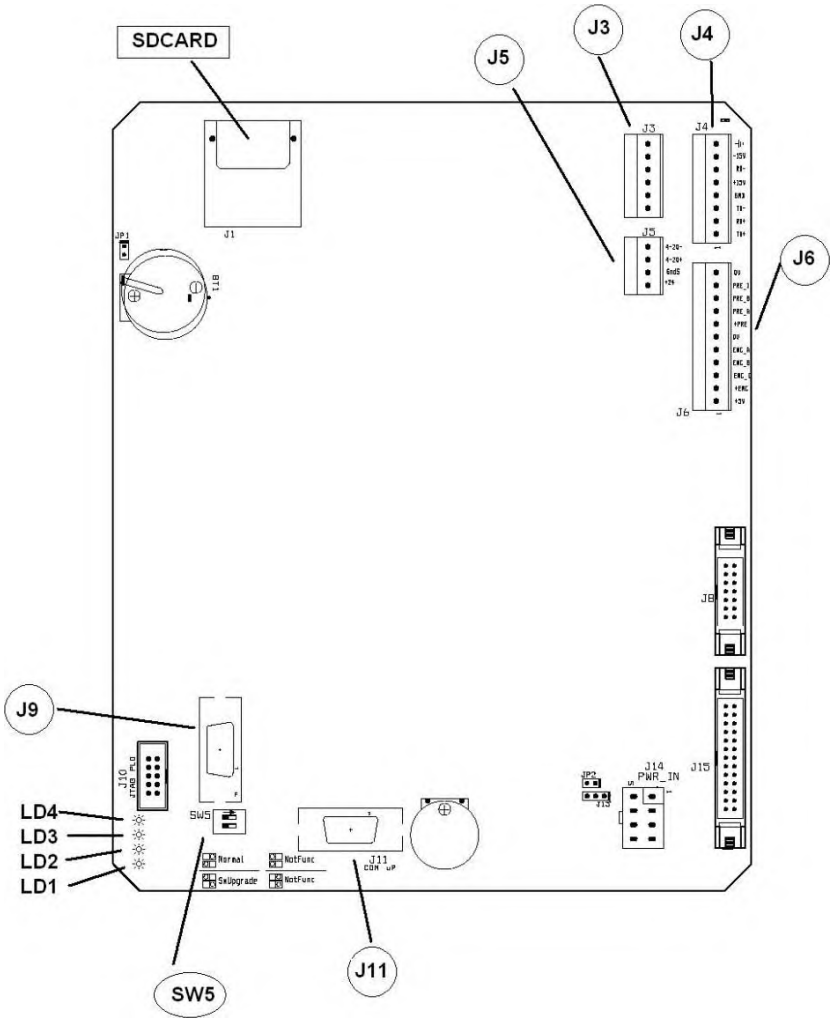
High side solenoid driver
PWM capability for power reduction
Short circuit proof
Up to 2000mA
The led LD1, LD2, LD3 mounted on the power board show the status of the EV1, EV2, EV3 respectively.
The led LD7 shows that the presence of the 24VDC power.

5.14 SOLENOID VALVE CONNECTIONS

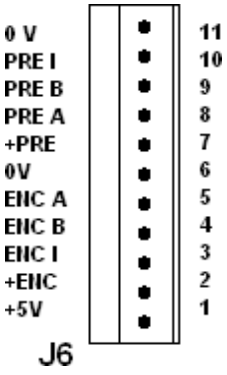
Connect pin 1 and 2 of J9. This makes available the internally produced 24Vdc to the solenoid valves.
Connect SOV1 to pin 3 and 4.
Connect SOV2 to pin 5 and 6.
Connect SOV3 to pin 7 and 8.

6 DISPLAY BOARD CONNECTIONS

The connections to the controller are made through screw-type terminal blocks on the printed circuit boards. The recommended torque for these screws is 1.95 lb-in / 0.22Nm (max wires section 1,5mm^2).



6.1 PRESSURE SENSORS AND ENCODER CONNECTIONS



Use always pin1 (+5V) to power the pressure sensors.

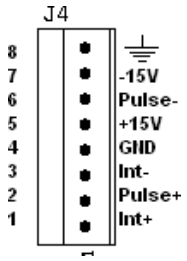
6.1.1 FEEDBACK PROBE

Three different models of feedback probes can be used

6.1.2 START/STOP INPUT

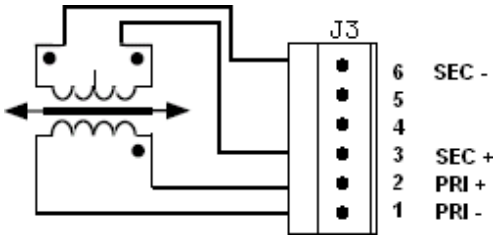
Balluff Micropulse trasducer or equivalent can be used.

For this probe the power supply is +/- 15V.



6.1.3 LVDT INPUT

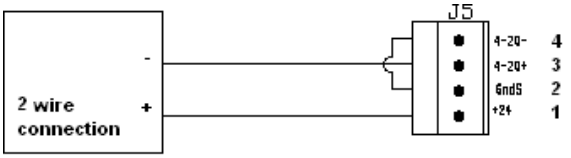
LVDT type : 4 wires
Resolution : 16 bit

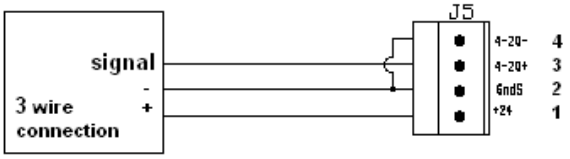


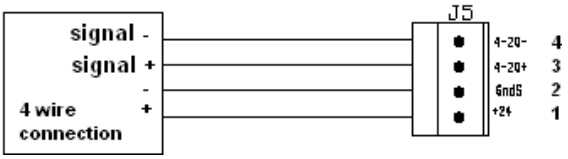
Pin 1 e 2 : primary circuit connection
Pin 3 e 6 : secondary circuit connection
Pin 4 e 5 : they are internally connected on the board and they can be used (if needed) for the secondary circuit connection

6.2 4-20mA INPUT

Input current, nominal	4-20mA
Input burden	475 Ω
Resolution	16 bit
Isolation Voltage	2500 V







7 CABLE ENTRIES CONFIGURATION

HOLES TAB.	POS	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	NOTE
PD21637_14	14	1" NPT	3/4" NPT	3/4" NPT	3/4" NPT	1/2" NPT	3/4" NPT	1/2" NPT	3/4" NPT	1" NPT	3/4" NPT	3/4" NPT	
PD21637_13	13	3/4" NPT	3/4" NPT	1/2" NPT	1/2" NPT	-	-	1/2" NPT	3/4" NPT	1" NPT			
PD21637_12	12	3/4" NPT	3/4" NPT	1/2" NPT	1/2" NPT	-	-	-	-	3/4" NPT	3/4" NPT	1/2" NPT	
PD21637_11	11	3/4" NPT	3/4" NPT	1/2" NPT	1/2" NPT	-	-	-	-	-	3/4" NPT	3/4" NPT	
PD21637_10	10	3/4" NPT	3/4" NPT	1/2" NPT	1/2" NPT	-	-	1/2" NPT	3/4" NPT	-	3/4" NPT	1/2" NPT	STD IECEx
PD21637_09	9	3/4" NPT	3/4" NPT	1/2" NPT	1/2" NPT	-	-	1/2" NPT	3/4" NPT	3/4" NPT	3/4" NPT	1/2" NPT	
PD21637_08	8	3/4" GAS	3/4" GAS	1/2" GAS	1/2" GAS	1/2" NPT	3/4" NPT	-	-	-			
PD21637_07	7	1/2" GAS	1/2" GAS	1/2" GAS	1/2" GAS	1/2" NPT	3/4" NPT	-	-	-			
PD21637_06	6	3/4" GAS	3/4" GAS	3/4" GAS	3/4" GAS	1/2" NPT	3/4" NPT	-	-	-			
PD21637_05	5	3/4" NPT	3/4" NPT	1/2" NPT	1/2" NPT	1/2" NPT	3/4" NPT	-	-	-			STD Exd
PD21637_04	4	1/2" NPT	1/2" NPT	1/2" NPT	1/2" NPT	1/2" NPT	3/4" NPT	-	-	-			
PD21637_03	3	3/4" NPT	3/4" NPT	3/4" NPT	3/4" NPT	1/2" NPT	3/4" NPT	-	-	-			
PD21637_02	2	1" NPT	1/2" NPT	1/2" NPT	1/2" NPT	1/2" NPT	3/4" NPT	-	-	-			
PD21637_01	1	1" NPT	3/4" NPT	3/4" NPT	3/4" NPT	1/2" NPT	3/4" NPT	-	-	-			

Cable entries tolerances according to ANSI/ASME B1.20.1

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INSTRUCTION MANUAL
DPS (DIGITAL POSITION SYSTEM)
QT series (Spool valve CV9)

INDEX

1.0		**Fail mode operation**	2
	1.1	CV9 Fail-Open, Fail-Close or Fail-In Place	2
2.0		**Spool valve manifold CV9**	3
	2.1	To remove the device from the actuator	3

1.0 FAIL MODE OPERATION

DPS series QT will fail on loss of power, loss of air supply or loss of signal.

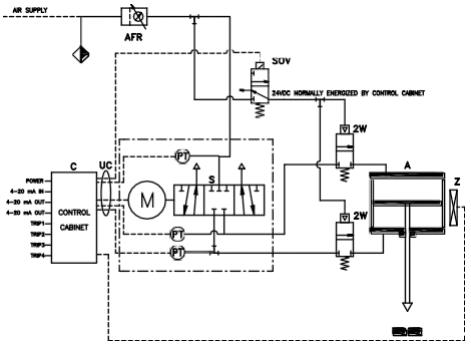
- Loss of power: causes the Digital Controller to trip the Solenoid Valve for Fail Mode.
- Loss of air supply: is detected by a pressure transducer in the Servo-Valve; the Digital Controller trips the Solenoid Valve for Fail Mode when the air pressure drops below a set point in the Controller software.
- Loss of signal: causes the Digital Controller to position the valve at its fail position.

1.1 CV 9 Fail-Open, Fail-Close or Fail-In Place

The CV 9 model uses standard STI 3 or 2 ways valve (size 1"1/2) which drives the Servo-Valve to Fail-Open, Fail-Closed or Fail-In Place. The 3 or 2 ways valves (3W or 2W) are piloted by a 24Vdc solenoid valve (SOV). The solenoid valve (SOV) is piloted by the Digital Controller (C).

For further details on schematic and fail mode, please refer to the specific project documentation.

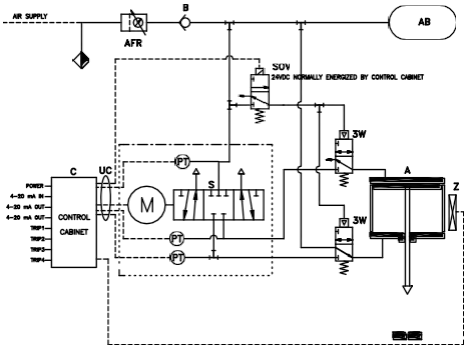
FAIL IN



ITEM	DESCRIPTION
A	ACTUATOR
AFR	AIR FILTER REGULATOR
SOV	SOLENOID VALVE
C	CONTROL CABINET
S	SERVO VALVE
B	CHECK VALVE
2W	2 WAYS VALVE
PT	PRESSURE TRANSDUCER
Z	FEEDBACK PROBE
UC	UMBILICAL CABLE

CONTROL LOGIC				
AIR SUPPLY	OK	FAIL	OK/FAIL	OK
POWER	OK	OK/FAIL	FAIL	OK
SIGNAL	OK	OK/FAIL	OK/FAIL	FAIL
VALVE POSITION	MODULATING	IN PLACE	IN PLACE	IN PLACE/ %STROKE

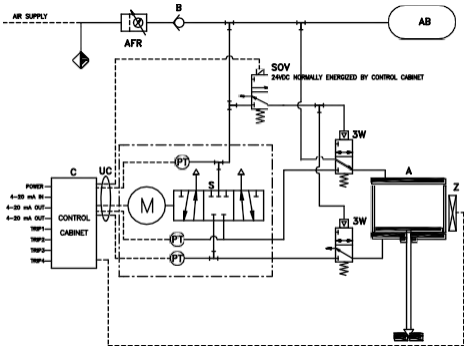
FAIL OPEN



ITEM	DESCRIPTION
A	ACTUATOR REGULATOR
AFR	
SOV	SOLENOID VALVE
C	CONTROL CABINET
S	SERVO VALVE
AB	AIR BOTTLE
B	CHECK VALVE
3W	3 WAYS VALVE
PT	PRESSURE TRANSDUCER
Z	FEEDBACK PROBE
UC	UMBILICAL CABLE

CONTROL LOGIC				
AIR SUPPLY	OK	FAIL	OK/FAIL	OK
POWER	OK	OK/FAIL	FAIL	OK
SIGNAL	OK	OK/FAIL	OK/FAIL	FAIL
VALVE POSITION	MODULATING	OPEN	OPEN	OPEN/ %STROKE

FAIL



ITEM	DESCRIPTION
A	ACTUATOR REGULATOR
AFR	
SOV	SOLENOID VALVE
C	CONTROL CABINET
S	SERVO VALVE
AB	AIR BOTTLE
B	CHECK VALVE
3W	3 WAYS VALVE
PT	PRESSURE TRANSDUCER
Z	FEEDBACK PROBE
UC	UMBILICAL CABLE

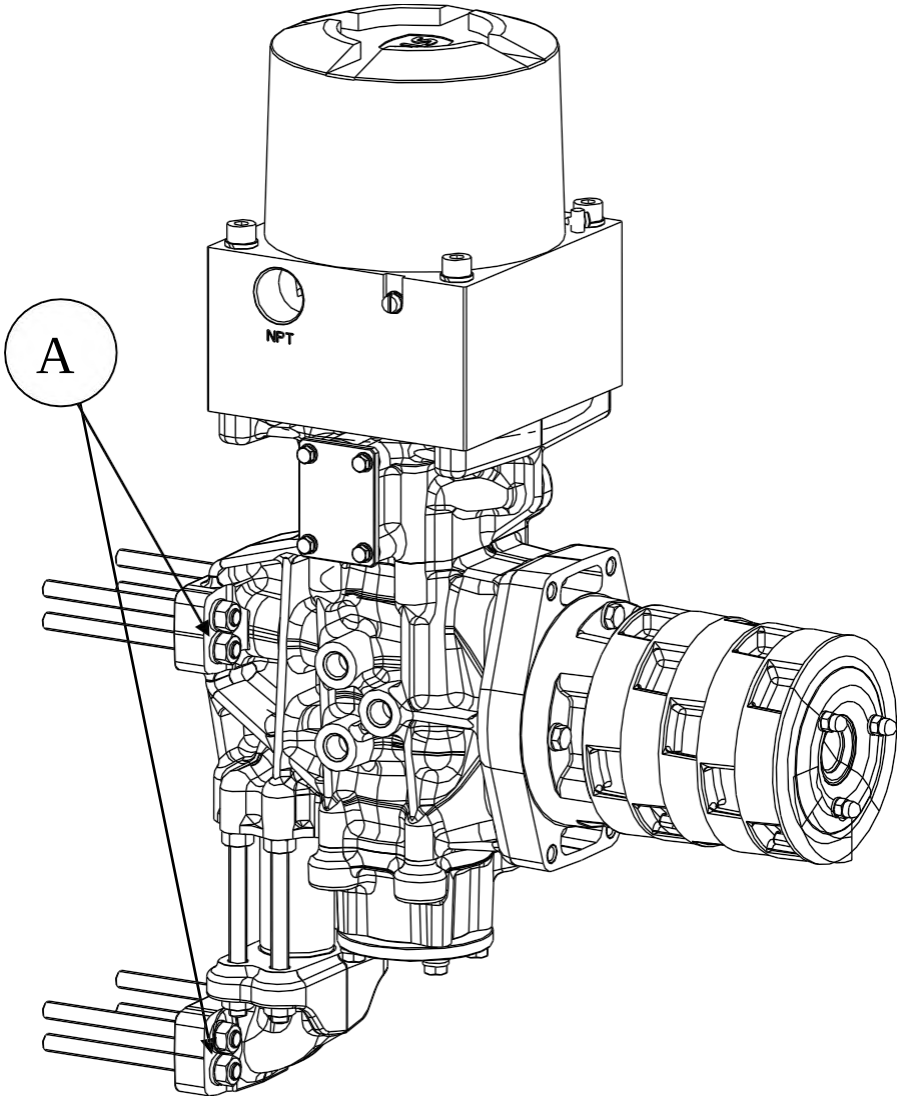
CONTROL LOGIC				
AIR SUPPLY	OK	FAIL	OK/FAIL	OK
POWER	OK	OK/FAIL	FAIL	OK
SIGNAL	OK	OK/FAIL	OK/FAIL	FAIL
VALVE POSITION	MODULATING	CLOSE	CLOSE	CLOSE/ %STROKE

2.0 SPOOL VALVE MANIFOLD CV9

No maintenance operations are required on the spool valve manifold. In case of abnormal noise or malfunction contact STI.

2.1 To remove the device from the actuator:

- disconnect the supply line from the manifold and all electrical conduit;
- unscrew the 8 nuts on the tie rod (pos. A);
- remove the device from the actuator.



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INSTRUCTION MANUAL
DPS (DIGITAL POSITION SYSTEM)
QT series (Spool valve CV30)

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2.0		**Spool valve manifold CV30**	3
	2.1	To remove the device from the actuator	3

1.0 FAIL MODE OPERATION

DPS series QT will fail on loss of power, loss of air supply or loss of signal.

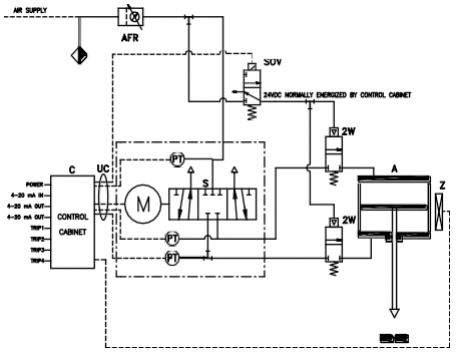
- Loss of power: causes the Digital Controller to trip the Solenoid Valve for Fail Mode.
- Loss of air supply: is detected by a pressure transducer in the Servo-Valve; the Digital Controller trips the Solenoid Valve for Fail Mode when the air pressure drops below a set point in the Controller software.
- Loss of signal: causes the Digital Controller to position the valve at its fail position.

1.1 CV 30 Fail-Open, Fail-Close or Fail-In Place

The CV 30 model uses standard STI 3 or 2 ways valve (size 2") which drives the Servo-Valve to Fail-Open, Fail-Closed or Fail-In Place. The 3 or 2 ways valves (3W or 2W) are piloted by a 24Vdc solenoid valve (SOV). The solenoid valve (SOV) is piloted by the Digital Controller (C).

For further details on schematic and fail mode, please refer to the specific project documentation.

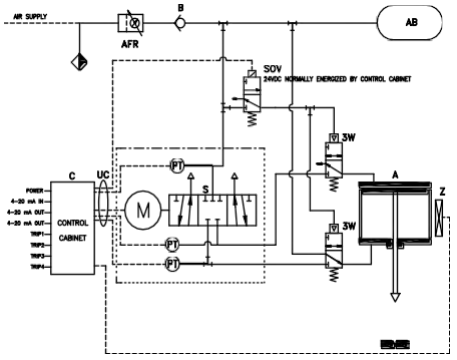
FAIL IN



ITEM	DESCRIPTION
A	ACTUATOR
AFR	AIR FILTER REGULATOR
SOV	SOLENOID VALVE
C	CONTROL CABINET
S	SERVO VALVE
B	CHECK VALVE
2W	2 WAYS VALVE
PT	PRESSURE TRANSDUCER
Z	FEEDBACK PROBE
UC	UMBILICAL CABLE

CONTROL LOGIC				
AIR SUPPLY	OK	FAIL	OK/FAIL	OK
POWER	OK	OK/FAIL	FAIL	OK
SIGNAL	OK	OK/FAIL	OK/FAIL	FAIL
VALVE POSITION	MODULATING	IN PLACE	IN PLACE	IN PLACE/ %STROKE

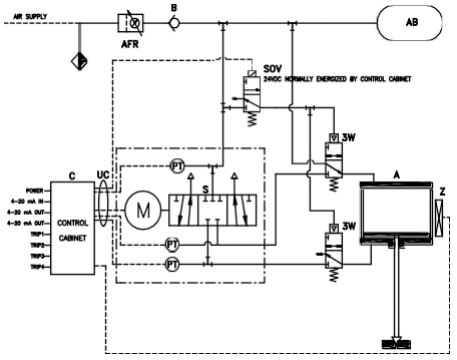
FAIL OPEN



ITEM	DESCRIPTION
A	ACTUATOR REGULATOR
AFR	
SOV	SOLENOID VALVE
C	CONTROL CABINET
S	SERVO VALVE
AB	AIR BOTTLE
B	CHECK VALVE
3W	3 WAYS VALVE
PT	PRESSURE TRANSDUCER
Z	FEEDBACK PROBE
UC	UMBILICAL CABLE

CONTROL LOGIC				
AIR SUPPLY	OK	FAIL	OK/FAIL	OK
POWER	OK	OK/FAIL	FAIL	OK
SIGNAL	OK	OK/FAIL	OK/FAIL	FAIL
VALVE POSITION	MODULATING	OPEN	OPEN	OPEN/ %STROKE

FAIL



ITEM	DESCRIPTION
A	ACTUATOR REGULATOR
AFR	
SOV	SOLENOID VALVE
C	CONTROL CABINET
S	SERVO VALVE
AB	AIR BOTTLE
B	CHECK VALVE
3W	3 WAYS VALVE
PT	PRESSURE TRANSDUCER
Z	FEEDBACK PROBE
UC	UMBILICAL CABLE

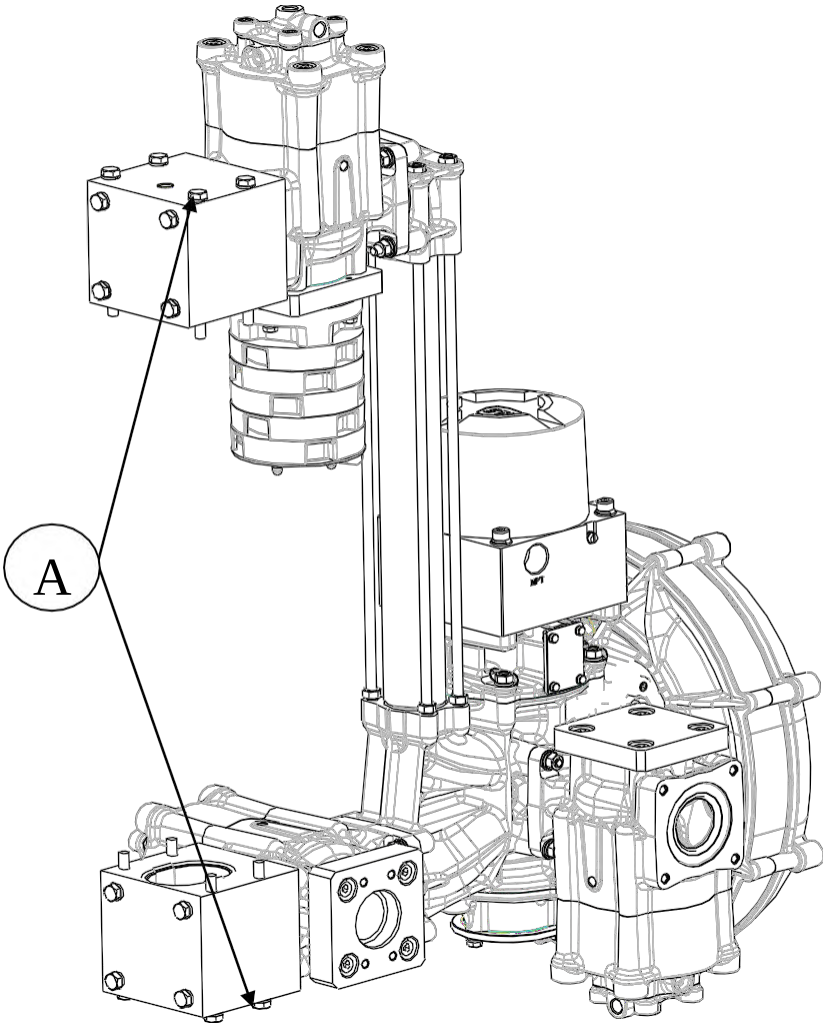
CONTROL LOGIC				
AIR SUPPLY	OK	FAIL	OK/FAIL	OK
POWER	OK	OK/FAIL	FAIL	OK
SIGNAL	OK	OK/FAIL	OK/FAIL	FAIL
VALVE POSITION	MODULATING	CLOSE	CLOSE	CLOSE/ %STROKE

2.0 SPOOL VALVE MANIFOLD CV30

No maintenance operations are required on the spool valve manifold. In case of abnormal noise or malfunction contact STI.

2.1 To remove the device from the actuator:

- disconnect the supply line from the manifold and all electrical conduit;
- unscrew the 8 screws on the block (pos. A);
- remove the device from the actuator.



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INSTRUCTION MANUAL
DPS (DIGITAL POSITION SYSTEM)
QT series (controller)

INDEX

1.0		**General prescriptions**	**2**
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	1.2	General safety instructions	2
		1.2.1 Installation	2
		1.2.2 Maintenance	3
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3.0		**Mounting procedure**	**3**
4.0		**Maintenance operation**	**3**
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1 GENERAL PRESCRIPTIONS

It is strongly recommended that this entire manual be read before attempting to install and operate the system

1.1 MANUFACTURER'S IDENTIFICATION DATA

Every controller mod. DPS is provided with a name plate with its serial number. The year of manufacturing is indicated by the first two numbers of the serial number.

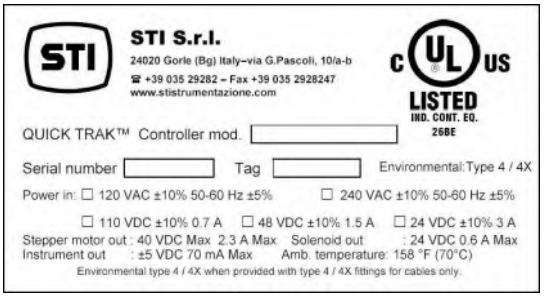


fig. 1 - Sample of equipment label

Do not remove it and/or replace with other name plates.

Range of the permissible ambient temperature are: -40°÷ 70°C for T6

1.2 GENERAL SAFETY INSTRUCTIONS

The non-observation of the following safety instruction and of the instruction manuals brings with it danger of explosions with serious injury or operator death.

1.2.1 INSTALLATION

- An external ground connection is present at the side of controller.

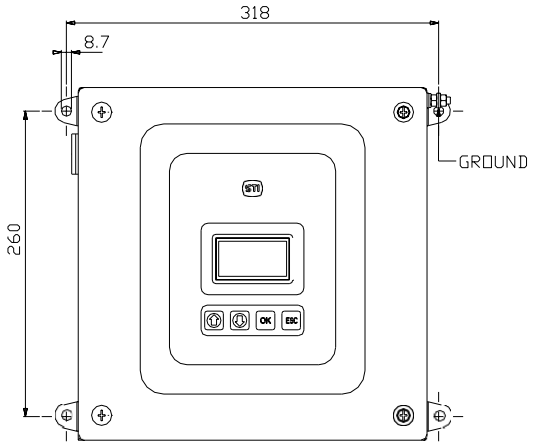


fig. 2 - External ground connection

- The electrical connections must be done according to the diagram and label.

- The internal ground connection is mandatory.
- The actuator must be installed and used according to the project design specification.
- The fluid must be chemically compatible with the used gaskets and lubricant.
- The supply circuits must be protect in case of current exceeding the limits fixed.

1.2.2 MAINTENANCE

- Must be done by qualified person who is trained to operate into potentially explosive atmosphere.
- Tools and equipment must be suitable for potentially explosive atmosphere where the actuator is installed.
- Cleaning must be done with a humid cloth.

2. GENERAL FEATURES

The controller mod. DPS is composed by an enclosure in which are housed a power supply, terminal blocks, display, local controls and a digital controller provides closed-loop control of valve position based upon input signal, valve position feedback, spool position feedback, and stepper- motor control. The Digital Controller can be mounted directly to the actuator or remote-mounted.
O-ring gaskets between the enclosure and the cover and between the enclosure and the support columns are used in order to guarantee the IP protection degree of the enclosure.

TECHNICAL FEATURES	
This device meets requirements for CE conformity certification. Basic technical specifications: CEI EN55022; CEI EN 50082-2.	
Input Signal / Position Feedback……	4-20 mA; Hart protocol
Ambient temperature : ……	T6 = -40° to +70°C
Maximum power consumption……..	P_o: 95W
Power supply:……..	From 100 to 240 Vac ±10% 50-60Hz ±5%
	From 24 to 240 Vdc ±10% (0.3 to 4A)
Conduit entries : …….	see relevant drawing

3. MOUNTING PROCEDURE

CAUTION: The electrical and pneumatic connections must be done according to the diagram and label

The controller enclosure is rated for IP66 environment. Outdoor mounting is acceptable, however, the controller should be protected from direct sunlight by a suitable shade (see temperature rating). For proper reading of the LCD screen, the controller should be mounted with the pushbuttons below the screen. The controller should be mounted securely to a sturdy mechanical surface using four screws in the enclosure mounting flange holes, with washers. See figure below for hole size and position. The structure, at the controller mounting location, should not be subjected to temperatures higher than the maximum ambient temperature described above.

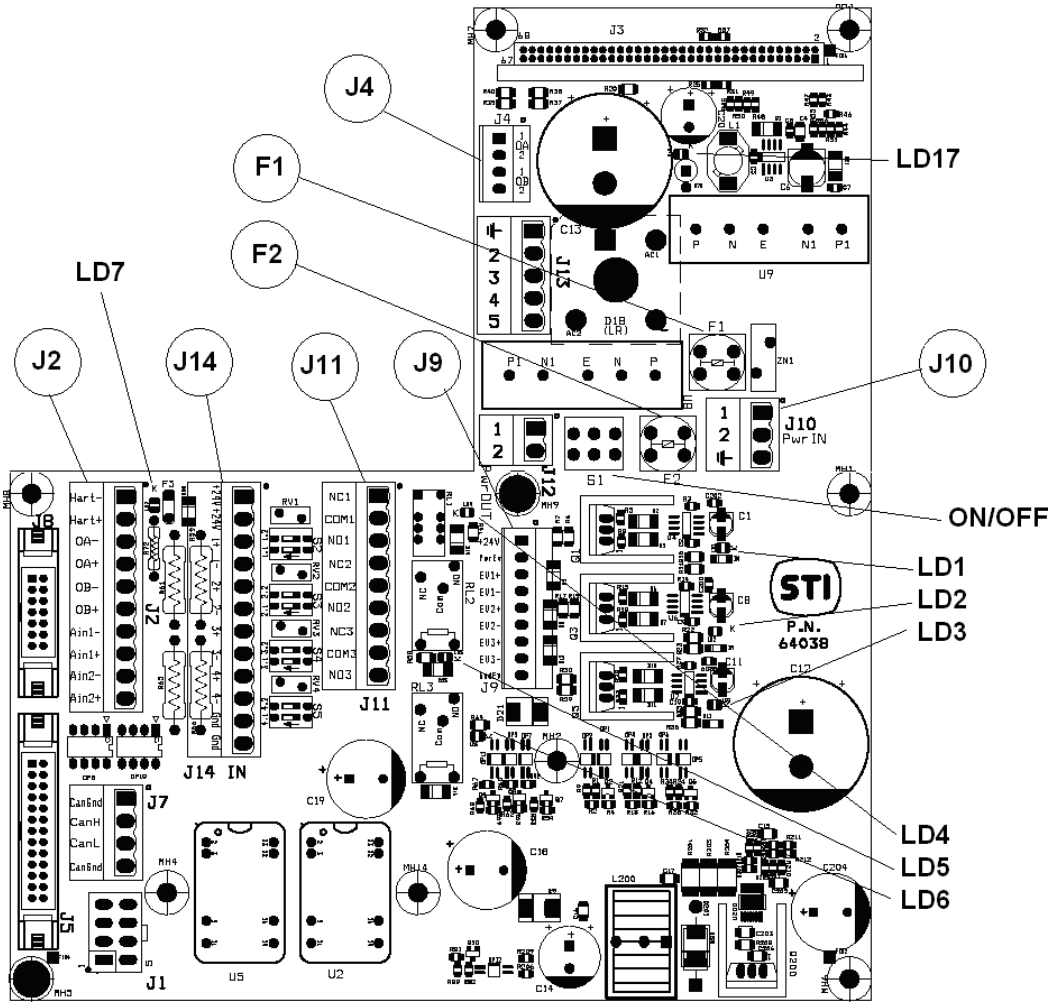
4. MAINTENANCE OPERATION

No maintenance operations are required on the controller.

WARNING: If the communications mode via RS-232 serial interface is required, be careful that the controller can be opened only when the unit is in a non hazardous environment.

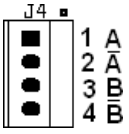
5 POWER BOARD CONNECTION

The connections to the power board terminals are made through screw-type terminal blocks on the printed circuit boards. The recommended torque for these screws is 4.5 lb-in / 0.5 Nm for all terminal boards (max wires section 2,5mm^2) except the terminal board J4 and J9 for which the recommended torque is 1.95 lb-in / 0.22Nm (max wires section 1,5mm^2).

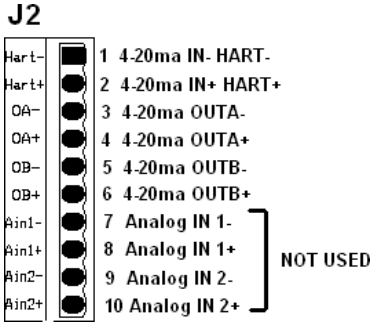


5.1 STEPPER MOTOR WIRING

J4 (already wired by the manufacturer) is the stepper motor connection (terminals 1-2-3-4).



5.2 INPUT AND OUTPUT SIGNAL WIRING



5.3 POSITION DEMAND : Pin 1,2

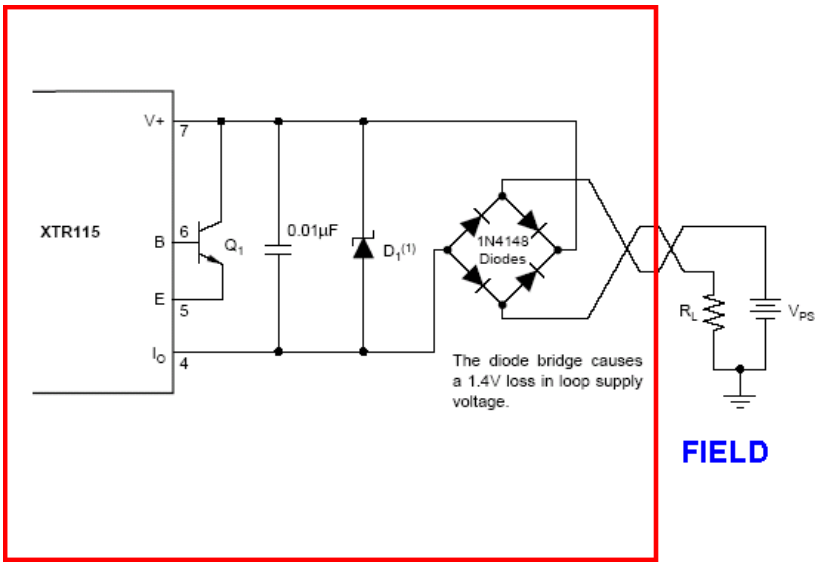
Input current, nominal	4-20mA
Input burden	475 Ω
Resolution	16 bit
Isolation Voltage	2500 V
HART revision	06

4-20mA input for position demand take power from an isolated source supplied from the controller

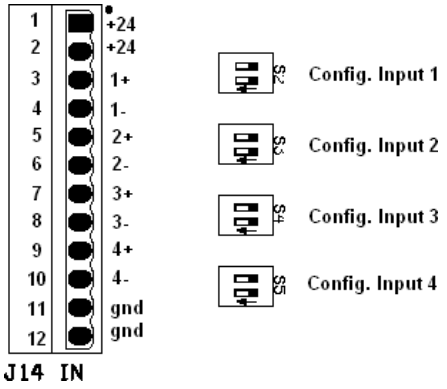
5.4 4-20mA OUTPUT : Pin 3,4 & 5,6

Isolation voltage	2500V
Output current (nominal)	4-20mA
Burden	750 Ω max (power supply = 24Vdc)
External power supply	24V (12..30V)
Resolution	12 bit

Each 4-20mA output must be powered from the field.

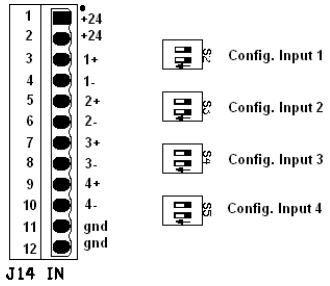


5.5 TRIP SIGNALS



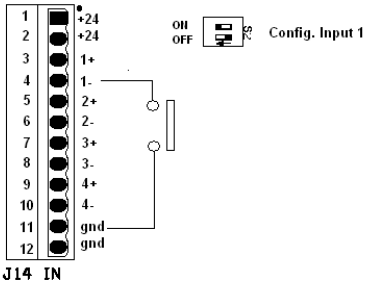
J14 Terminals are the input for trip signals.
Isolation voltage: 2500V
Input type : Free contact or 24Vac or 24Vdc
The led LD1, LD2, LD3, LD4 mounted on the display board show the status of the trip signal.

5.6 CONFIGURATIONS AND CONNECTIONS OF TRIP SIGNAL

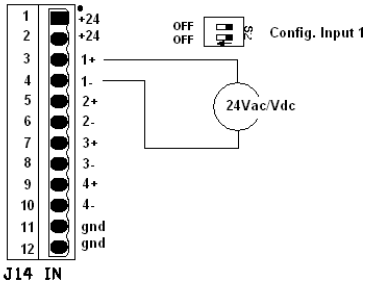


Examples (referred to TRIP1)

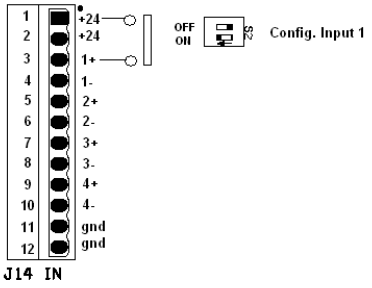
Configuration 1 : Free contact or NPN



Configuration 2 : 24Vac/Vdc

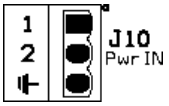


Configuration 3 : Free contact or PNP



5.7 SUPPLY WIRING

There are different adapters for AC and DC electrical power.



AC power : Standard available are 120 Vac and 240 Vac for alternate current power.

J10	
1	AC
2	AC
3	EARTH

DC power : Standard available are 24Vdc, 48Vdc, 110Vdc.

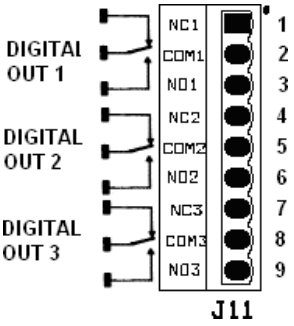
J10	
1	DC in +
2	DC in -
3	EARTH

5.8 FUSES

Supply / Fuse	F1	F2
120 Vac	800mA T	800mA T
240 Vac	400mA T	400mA T
24 Vdc	5A T	5A T
48 Vdc	2,5A T	2,5A T
110 Vdc	2A T	2A T

When the led LD17 is ON, it shows that the electronic board is powered.

5.9 DIGITAL OUTPUT (J11)



5.10 DIGITAL OUT1

■ Contact Ratings

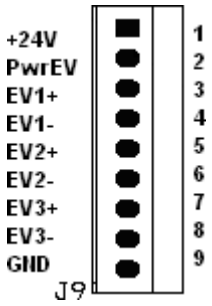
Load	Resistive load (cosϕ = 1)
Rated load	0.5 A at 125 VAC; 2 A at 30 VDC
Contact material	Ag (Au-clad)
Rated carry current	2 A
Max. switching voltage	250 VAC, 220 VDC
Max. switching current	2 A
Max. switching power	62.5 VA, 60 W
Min. permissible load	10 μA at 10 mVDC

5.11 DIGITAL OUT2 &3

CONTACT DATA	
Contact arrangement	1A, 1C
Initial contact resistance Max.	100mΩ (at 1A 6VDC)
Contact material	See ordering info.
Contact rating (Res. load)	NO: 5A 250VAC/30VDC NC: 3A 250VAC/30VDC
Max. switching voltage	250VAC / 30VDC
Max. switching current	5A
Max. switching power	1250VA / 150W

The led LD4, LD5, LD6 mounted on the power board show the status of the digital output 1, 2, 3 respectively.

5.12 SOLENOID VALVE SOV (J9)



5.13 3xON/OFF SOLENOID VALVE DRIVER CARACTHERISTICS

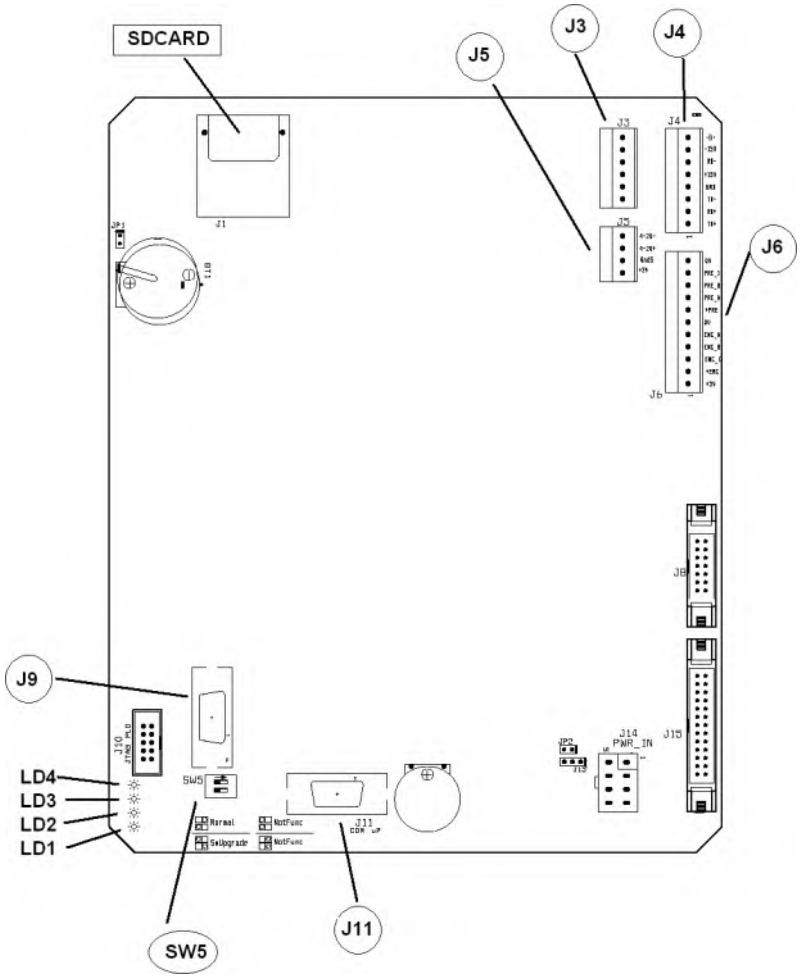
High side solenoid driver
PWM capability for power reduction
Short circuit proof
Up to 2000mA
The led LD1, LD2, LD3 mounted on the power board show the status of the EV1, EV2, EV3 respectively.
The led LD7 shows that the presence of the 24VDC power.

5.14 SOLENOID VALVE CONNECTIONS

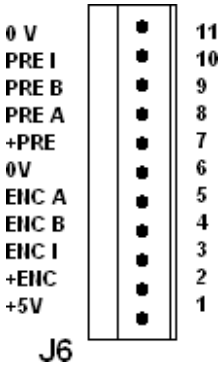
Connect pin 1 and 2 of J9. This makes available the internally produced 24Vdc to the solenoid valves.
Connect SOV1 to pin 3 and 4.
Connect SOV2 to pin 5 and 6.
Connect SOV3 to pin 7 and 8.

6 DISPLAY BOARD CONNECTIONS

The connections to the controller are made through screw-type terminal blocks on the printed circuit boards. The recommended torque for these screws is 1.95 lb-in / 0.22Nm (max wires section 1,5mm^2).



6.1 PRESSURE SENSORS AND ENCODER CONNECTIONS



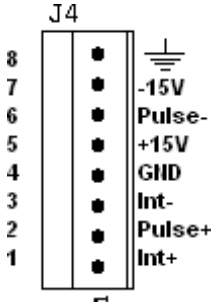
Use always pin1 (+5V) to power the pressure sensors.

6.1.1 FEEDBACK PROBE

Three different models of feedback probes can be used

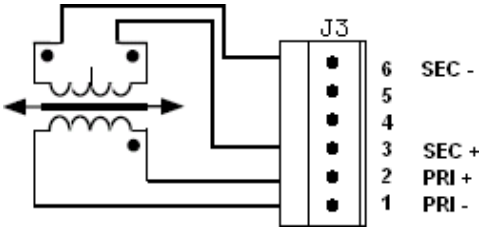
6.1.2 START/STOP INPUT

Balluff Micropulse trasducer or equivalent can be used.
For this probe the power supply is +/- 15V



6.1.3 LVDT INPUT

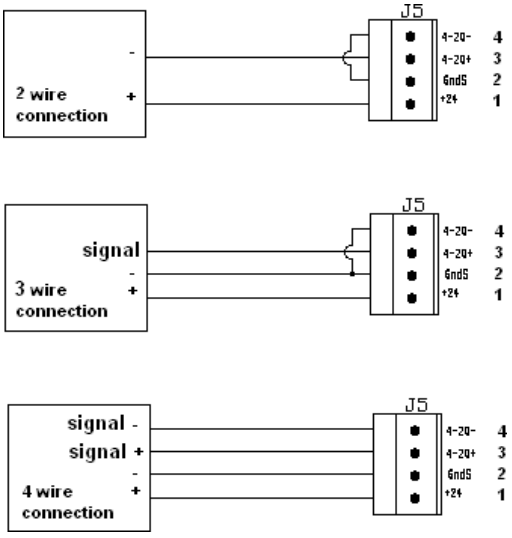
LVDT type : 4 wires
Resolution : 16 bit



Pin 1 e 2 : primary circuit connection
Pin 3 e 6 : secondary circuit connection
Pin 4 e 5 : they are internally connected on the board and they can be used (if needed) for the secondary circuit connection

6.2 4-20mA INPUT

Input current, nominal	4-20mA
Input burden	475 Ω
Resolution	16 bit
Isolation Voltage	2500 V



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INSTRUCTION MANUAL
DPS (DIGITAL POSITION SYSTEM)
QT series (motor)

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	1.2	General safety instructions	2
		1.2.1 Installation	2
		1.2.2 Maintenance	3
2.0		**General features**	**3**
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4.0		**Maintenance operation**	**5**

1 GENERAL PRESCRIPTIONS

Recommended that this entire manual be read before attempting to install and operate the system.

1.1 MANUFACTURER'S IDENTIFICATION DATA

Every step-motor enclosure mod. DPS is provided with a name plate with its serial number. The year of manufacturing is indicated by the first two numbers of the serial number.

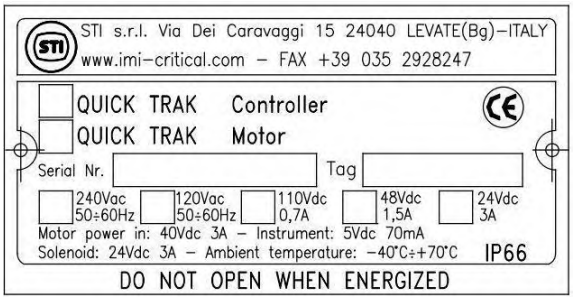

fig. 1 - Sample of equipment label

Manufacturing year is indicated by the two first digit number of the serial number.

Do not remove it and/or replace with other name plate.

Range of the permissible ambient temperature are:
-40°÷ 70°C

1.2 GENERAL SAFETY INSTRUCTIONS

The non-observation of the following safety instructions and of the instruction manuals ones brings with it danger of explosions with serious injury or operator's death.

1.2.1 Installation

- Must be done by qualified person trained to operate into potentially explosive atmosphere
- An external ground connection is present at the side of enclosure.
-

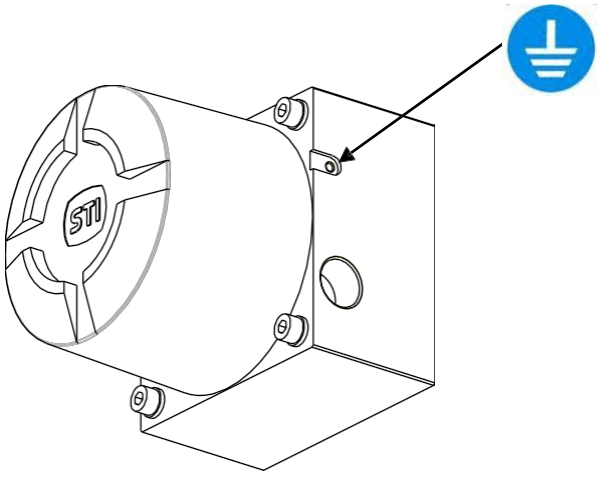

fig. 2 - External ground connection

- The electrical and pneumatic connections must be done according to the diagram and label.
- The supply circuit must be protected in case of current exceeding the limit fixed.
- The internal ground connection is mandatory.

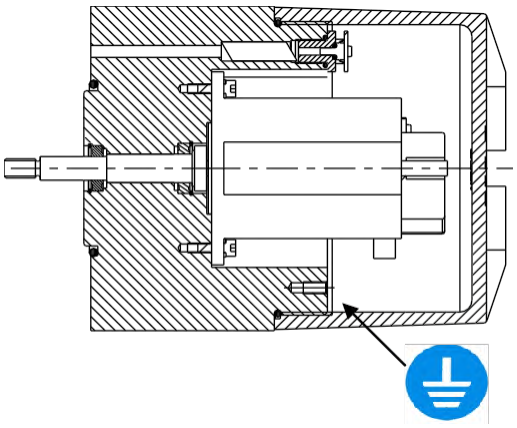

fig. 3 - Internal ground connection

- The actuator must be installed and used according to the project design specification.
- The fluid must be chemically compatible with the used gaskets and lubricant.
- The step motor must be used through the enclosed supplied controller STI ref. AD22255 (and relevant driver TRINAMIC model TMCM-035).
- The supply circuits must be protect in case of current exceeding the limits fixed The user has to ensure prior to start up and during operation that the pressure transducers are correctly fixed inside the enclosure all the time.
- The rated values for pressure transducer must be guarantee.

1.2.2 Maintenance

- Must be done by qualified person who is trained to operate into potentially explosive atmosphere.
- Tools and equipment must be suitable for potentially explosive atmosphere where the actuator is installed.
- Cleaning must be done with a humid cloth.
- Greases and oils must be used according to the manufacturer's instructions, however their flammability point must be > 140°C.

2. GENERAL FEATURES

The step-motor enclosure mod. DPS is composed by an enclosure in which a step-motor and 3 pressure transducers are installed and a cover. On the step-motor's shaft an extension shaft equipped with 2 rolling bearing is fitted.

O-ring gaskets between the enclosure and the cover and between the enclosure and the support columns are used in order to guarantee the protection degree of the enclosure.

TECHNICAL FEATURES	
This device meets requirements for CE conformity certification (CEI EN55022, CEI EN 50082-2).	
Ambient temperature : ……..….	-40° to +70°C
Step-motor electrical input parameters (with driver control): …… (POWERMAXII series M22NxxB)	- I_s (dc): 1.5A - V_s (dc): 40V
Step-motor mechanical output: ……..	1 (360°) actuation/sec
Pressure transducer electrical / pneumatic features: ……..… (FUJIKURA model XFGM-3001MPGSR)	- I_{max} (dc): 10 mA - V_{max} (dc): 5V - P_{range}: 0÷10 bar
Encoder supply voltage :……..……..……..	5V
Driver electrical input parameters: ……..… (TRINAMIC model TMCM-035)	- V_o (dc): 40V - I_o (dc): 3A
Conduit entries : …….....	N°2 holes 3/4” NPT F

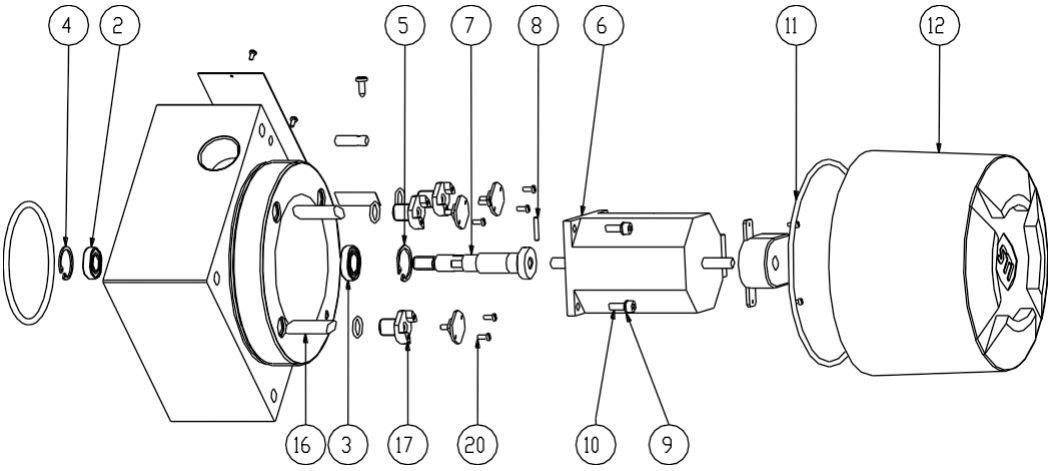

fig. 4 – Motor enclosure components

MATERIALS	
Housing:	Aluminum UNI EN 9002/5
Cover [12]:	Aluminum G-Al Si 9 Mn Mg UNI 3051
Shaft extension [7] :	Stainless Steel AISI 303
Rolling bearing [3-2]:	Stainless steel
Column supports for pressure transducers [17]:	Aluminum UNI EN 9002/5
Flameproof joint [16]	Stainless Steel AISI 303

3. MOUNTING PROCEDURE

The step-motor is supplied with a stem extension pos.7 connected by a pin pos. 8 to its shaft.

Do not remove the pin pos. 8 for any reason.

For mounting or dismounting operation, follow these instructions (see above picture):

- mount rolling bearing pos. 2 in its appropriate seat and then clip pos. 4
- mount rolling bearing pos. 3 in its appropriate seat and then clip pos. 5
- insert step-motor pos. 6 inside the enclosure, taking care not to make an excessive axial force on the step-motor's shaft; fix the step-motor to the enclosure by the 4 screws pos. 9-10
- insert N°3 flame proof joint pos. 16 inside the corresponding holes
- mount N°3 O-rings and screw the pressure transducers support columns pos. 17 inside the corresponding holes.
- mount O-ring pos. 11
- screw the cover pos. 12

For the cables wiring refer to relevant electric diagram

4. MAINTENANCE OPERATION

No maintenance operations are required on the stepping motor. In case of abnormal noise or malfunction contact STI.

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