MDHQSPC

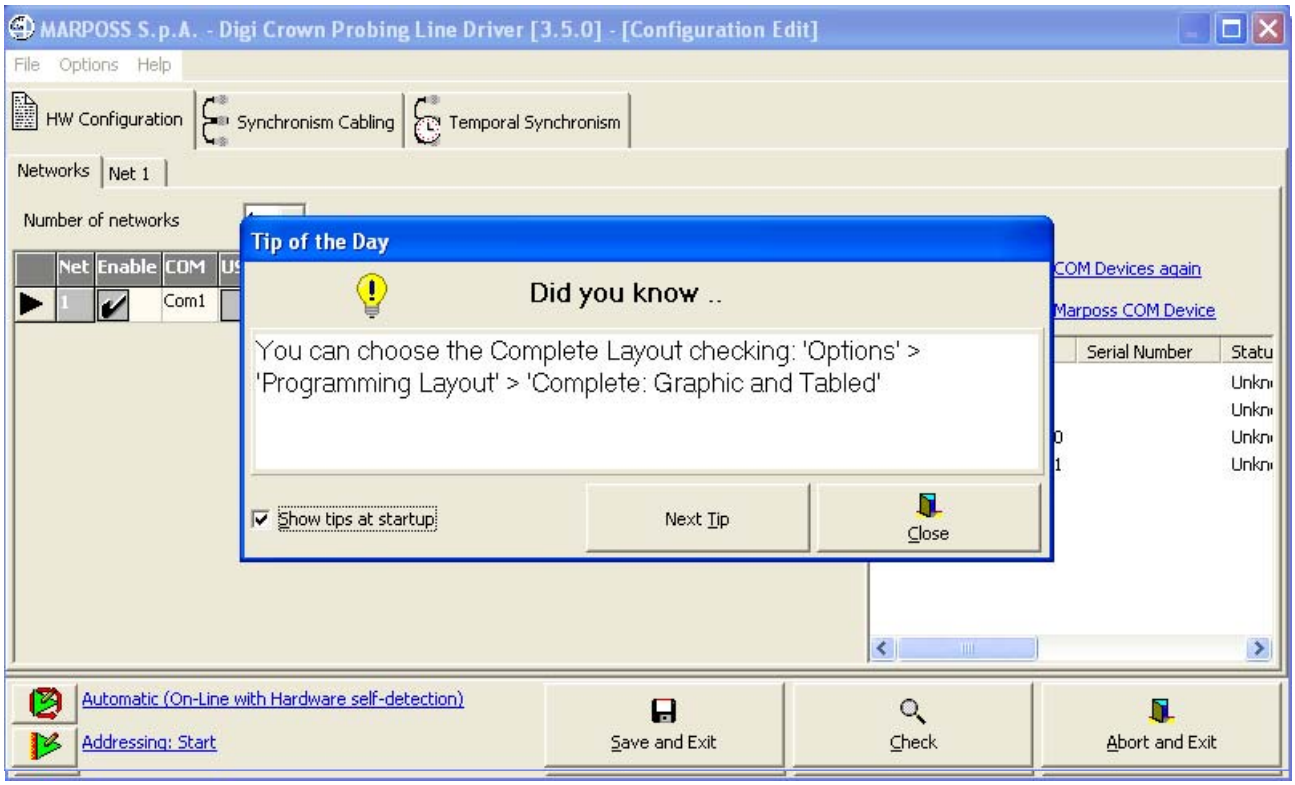
(V 3.6)

1 Introduction

MDHQSPC Driver Programmer allows creating, editing and testing configuration used by MDHQSPC Driver. It allows to design hardware configuration and perform a complete setup without hardware connection. If hardware is available it can also self detect hardware, test connection, check configuration and run it.

2 Tip of the Day

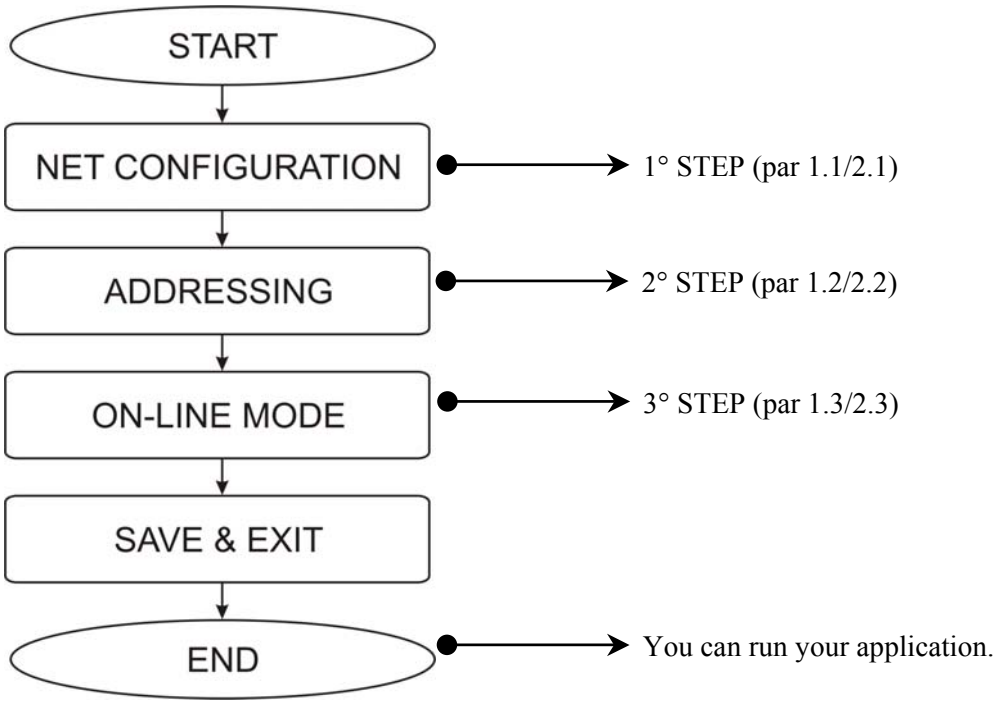
When MDHQSPC Driver Programmer starts with a new configuration it starts with the Simplified Interface while for any configuration previously saved it starts with the last Interface memorised (Simplified or Complete). But before you can do anything the MDHQSPC Driver Programmer shows a panel that allows you to read the tip of the day. You can deselect the option for showing these tips at startup or if you prefer keep on reading the next tips. Closing the "Tip of the Day" panel you could go on the appropriate Interface programming layout.



The chosen about the "Show tips at startup" is saved with the configuration data and thus the MDHQSPC Driver Programmer will later automatically open with or without it. However, it is always possible to change this choice or reading other tips showing the tips by means of Help / Tip of the Day menu.
The "Simplified" Interface programming layout starts by default and works only in tabled mode, although it is always possible to enable "Complete Interface" at a later time by means of Options / Programming Layout menu. With this layout you can make configuration, addressing and operative online session all within a simplified tabled environment.
On the other hand, "Complete" Interface programming layout works only in graphic mode, although it is possible to switch between graphic mode and tabled mode at any time through corresponding menu entries or tool buttons. Choose this option if you prefer a graphic approach, quite similar to previous versions of the programming DLL.
The chosen option ("complete" or "simplified") is saved with the configuration data and thus the MDHQSPC Driver Programmer will later automatically open with the programming layout desired. As said above, it is always possible to change this choice by means of Options / Programming Layout menu.
If you are working with "Simplified" Interface programming layout, you can go directly to chapter **6.**

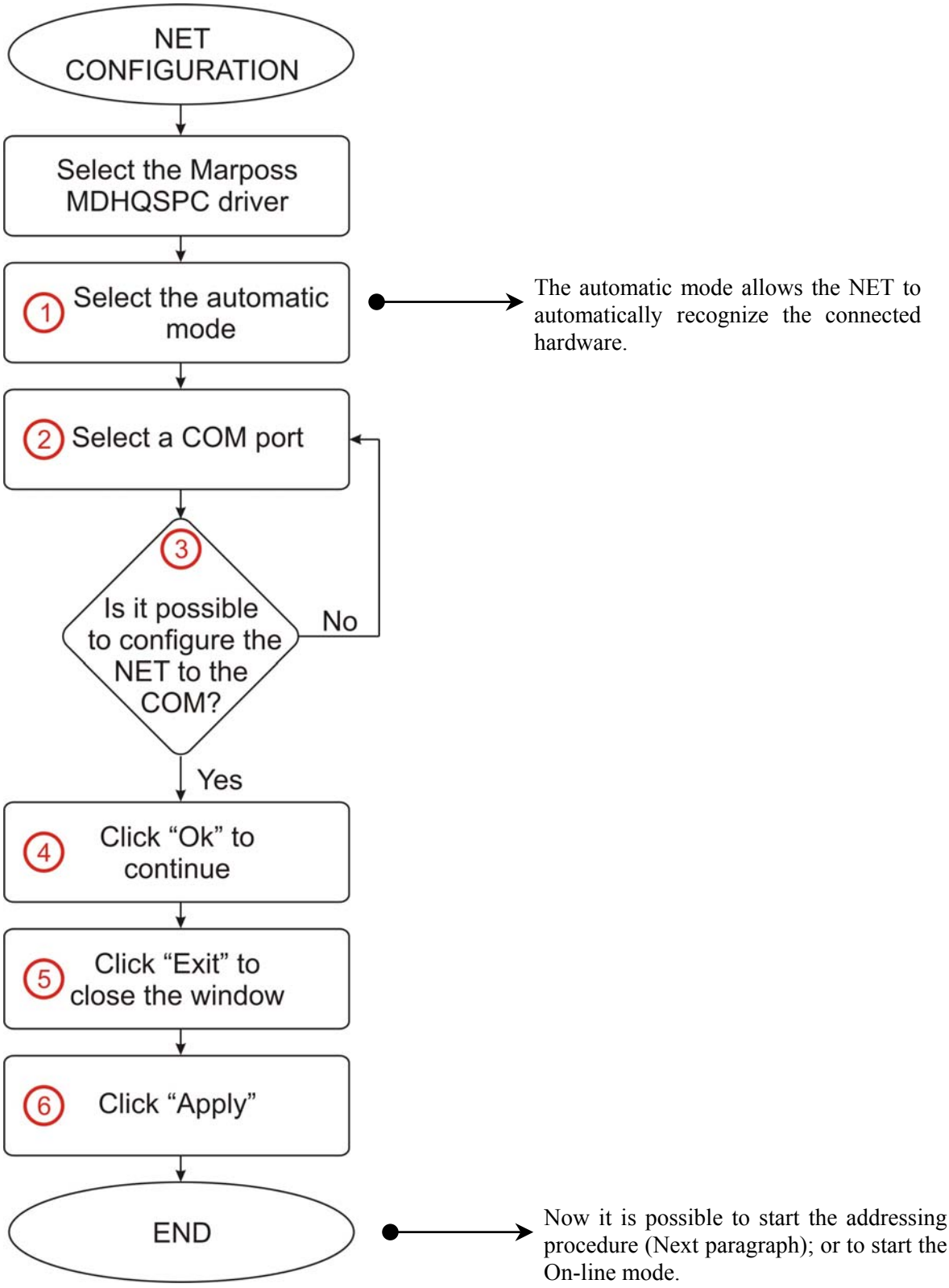
3 Quick Start Guide

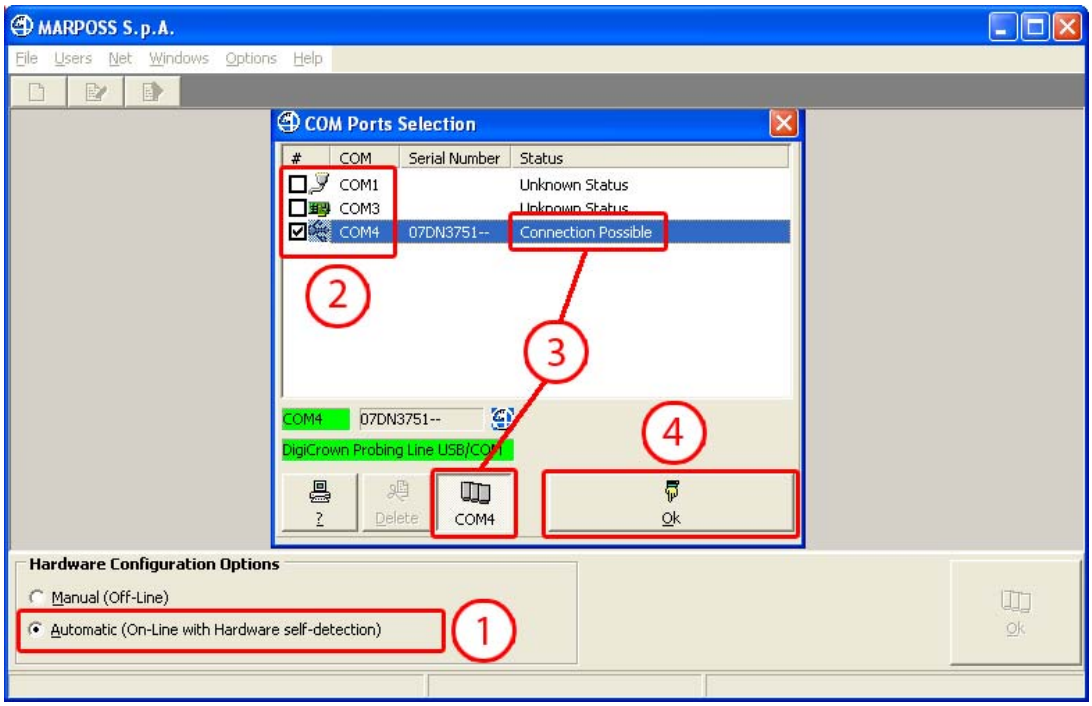
This manual provide all the instructions to be able to use DigiCrown driver, in addition to the detailed explanation of each single function, you could find at the beginning e **quick start** section that will allow to **run your first DigiCrown net in 3 step.** From that point on, you can explore the driver functionality alone or run your first applicalion.

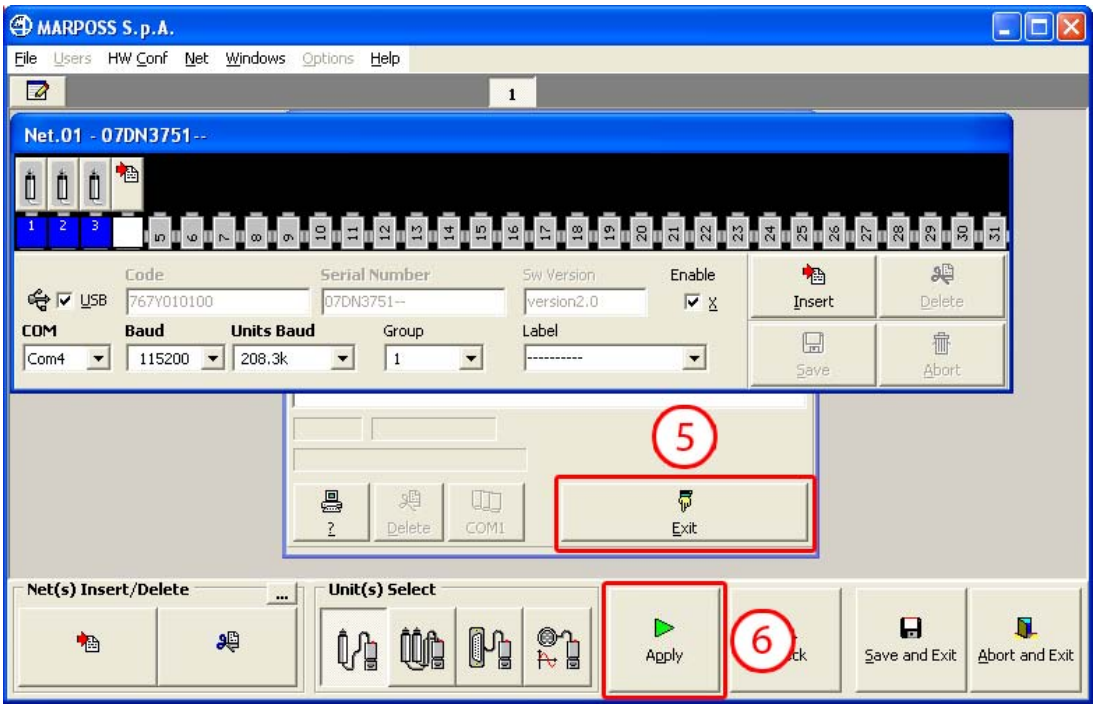


3.1 Complete Interface: Graphic and Tabled

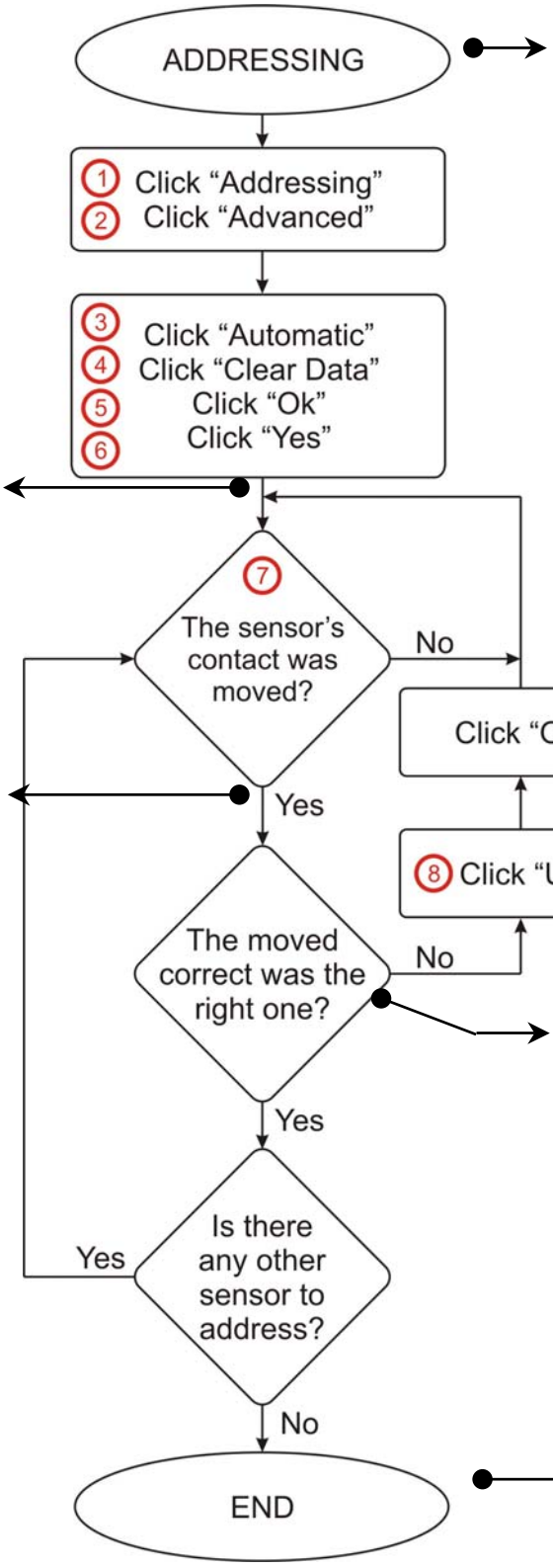
3.1.1 Configuration




MARPOSS S.p.A.
File Users Net Windows Options Help
COM Ports Selection
COM Serial Number Status
COM1 Unknown Status
COM3 Unknown Status
COM4 07DN3751-- Connection Possible
2
3
4
COM4 07DN3751--
DigiCrown Probing Line USB/COM
? Delete COM4 Ok
Hardware Configuration Options
Manual (Off-Line)
Automatic (On-Line with Hardware self-detection)
1
Ok


MARPOSS S.p.A.
File Users HW Conf Net Windows Options Help
1
Net.01 - 07DN3751--
Code Serial Number Sw Version Enable
USB 767Y010100 07DN3751-- version2.0 X
Insert Delete
COM Baud Units Baud Group Label
Com4 115200 208.3k 1 ----------
Save Abort
5
? Delete COM1 Exit
Net(s) Insert/Delete
Unit(s) Select
Apply
6
Save and Exit
Abort and Exit

3.1.2 Addressing



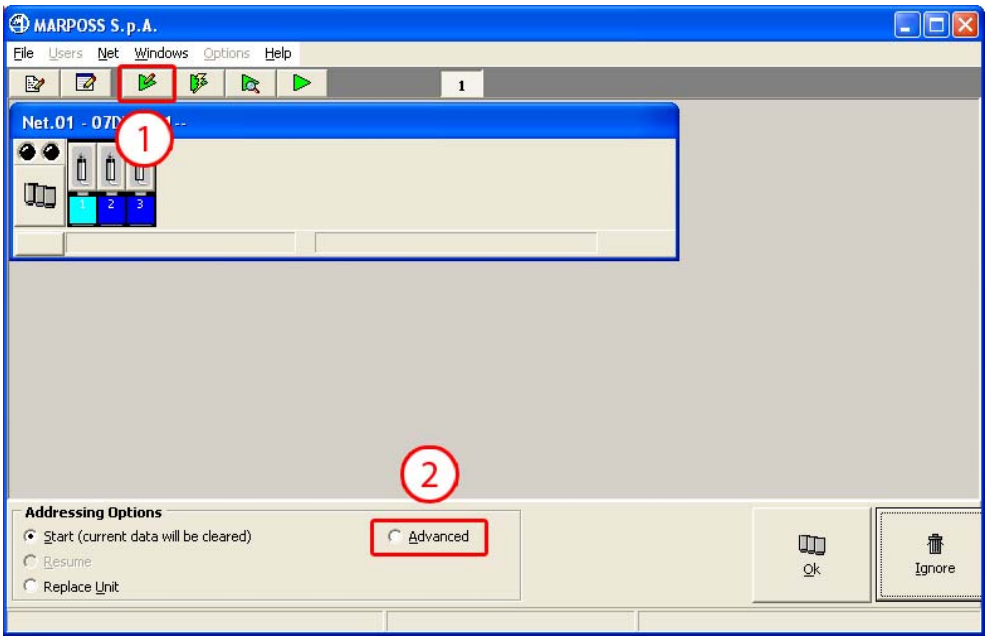
The addressing procedure can also be executed through QuickSPC/Fixture programmer application using the "Sensor Numbers Wizard"

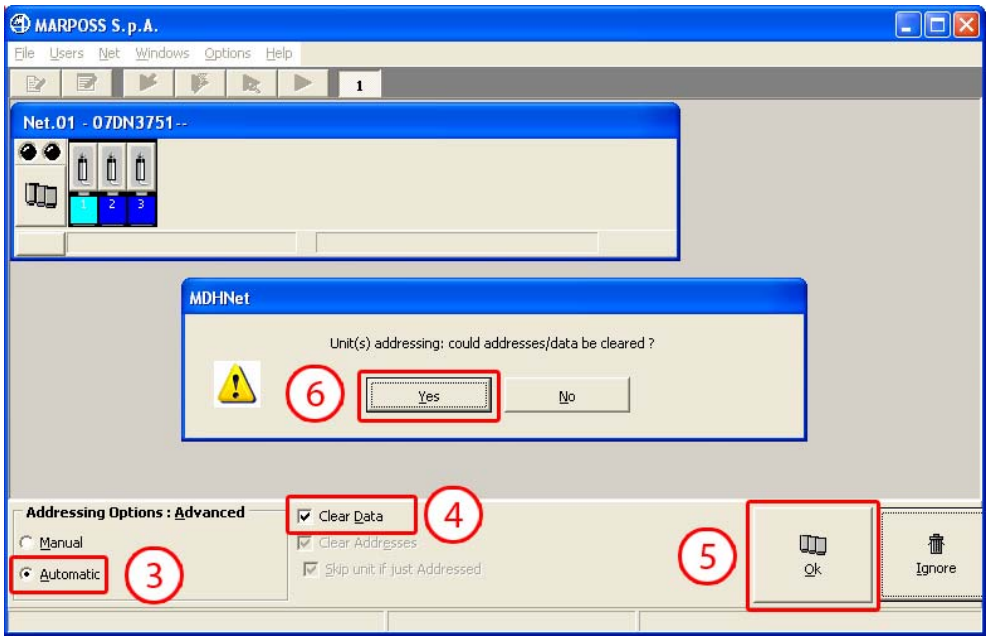
The software waits the sensor's contact to be moved for addressing.

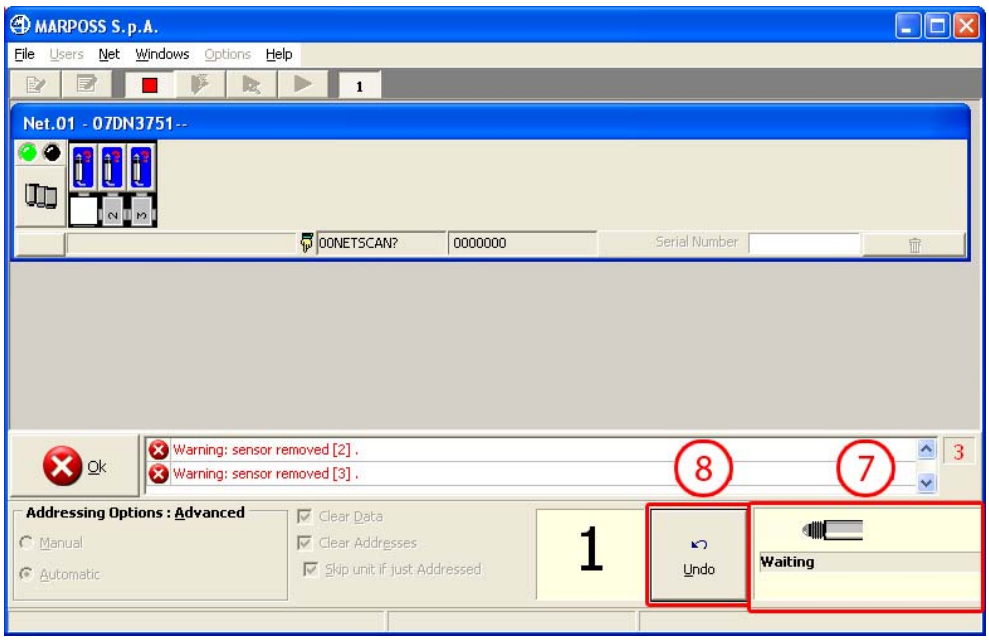
The software recognized and stored the just addressed sensor.

Is the addressed sensor the right one?
If not the addressing procedure can be repeated.

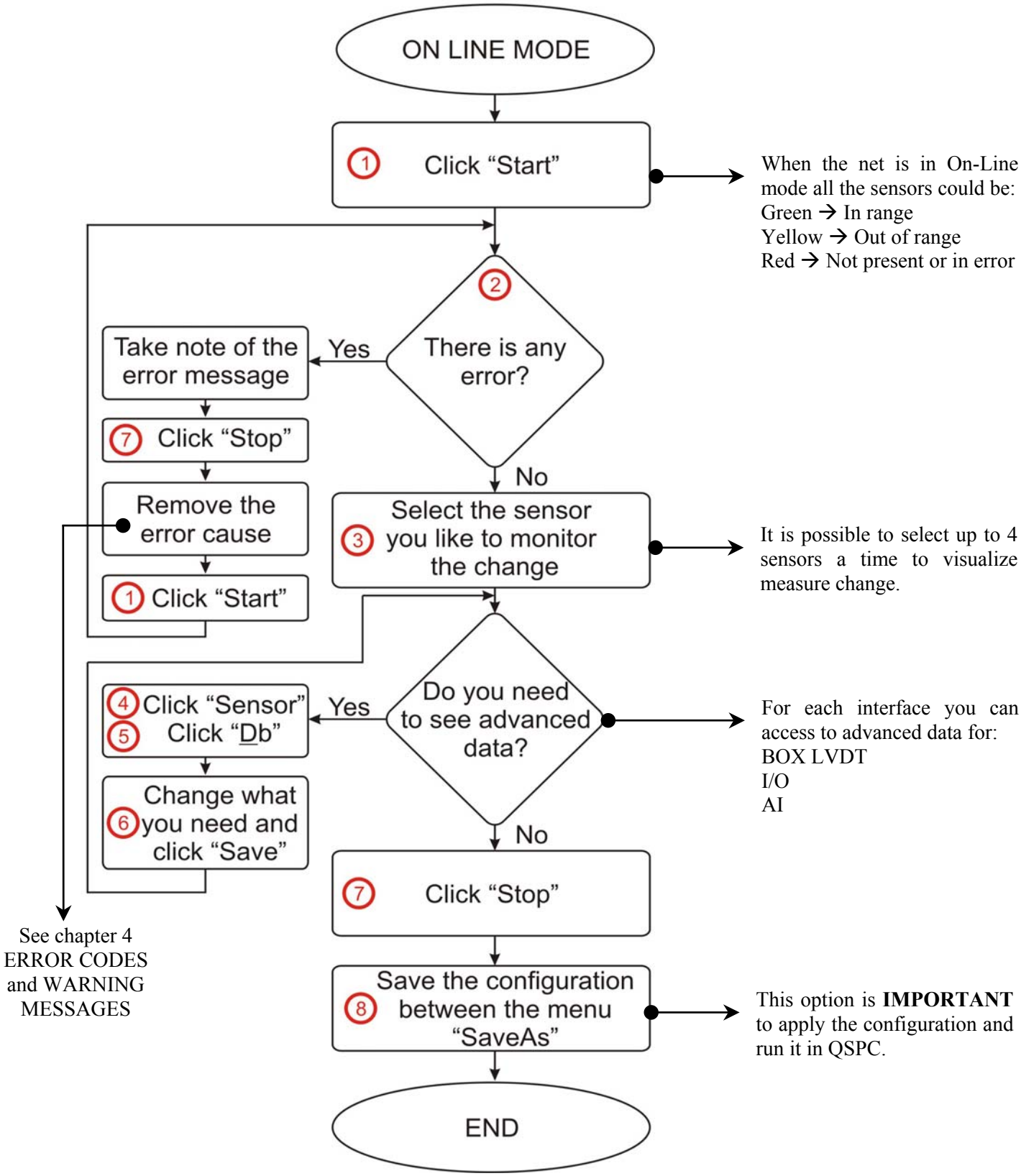
Now it is possible to start the On-line mode.
It is important to run the On-Line mode to apply the configuration and all the data.

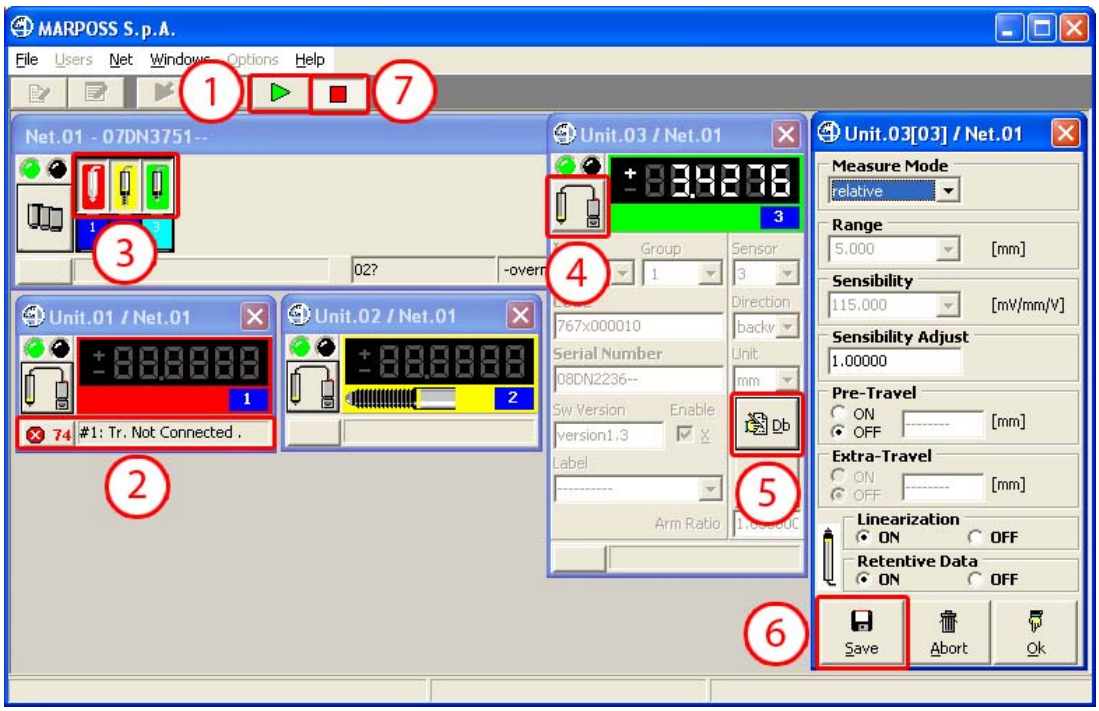

MARPOSS S.p.A.
File Users Net Windows Options Help
1
Net.01 - 07D
1
2
Addressing Options
Start (current data will be cleared)
Resume
Replace Unit
Advanced
Ok
Ignore

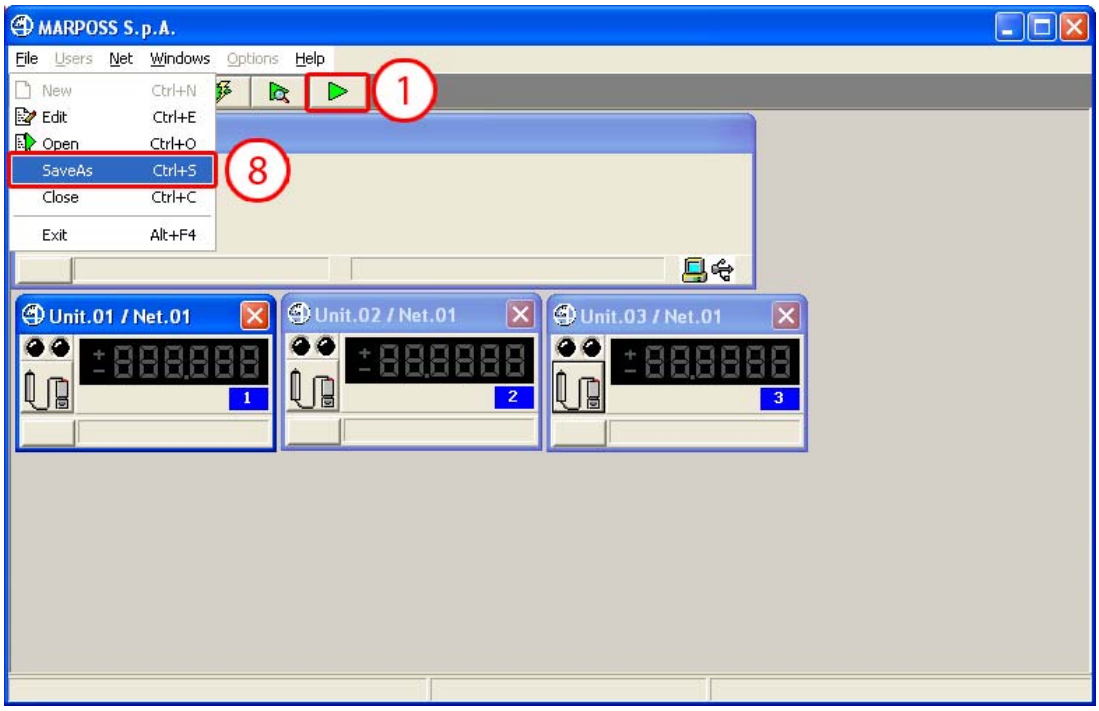

MARPOSS S.p.A.
File Users Net Windows Options Help
1
Net.01 - 07DN3751--
MDHNet
Unit(s) addressing: could addresses/data be cleared ?
6
Yes
No
Addressing Options : Advanced
Manual
Automatic
3
Clear Data
Clear Addresses
Skip unit if just Addressed
4
5
Ok
Ignore


MARPOSS S.p.A.
File Users Net Windows Options Help
1
Net.01 - 07DN3751--
00NETSCAN?
0000000
Serial Number
Ok
Warning: sensor removed [2] .
Warning: sensor removed [3] .
3
8
7
Addressing Options : Advanced
Manual
Automatic
Clear Data
Clear Addresses
Skip unit if just Addressed
1
Undo
Waiting

3.1.3 On-line mode

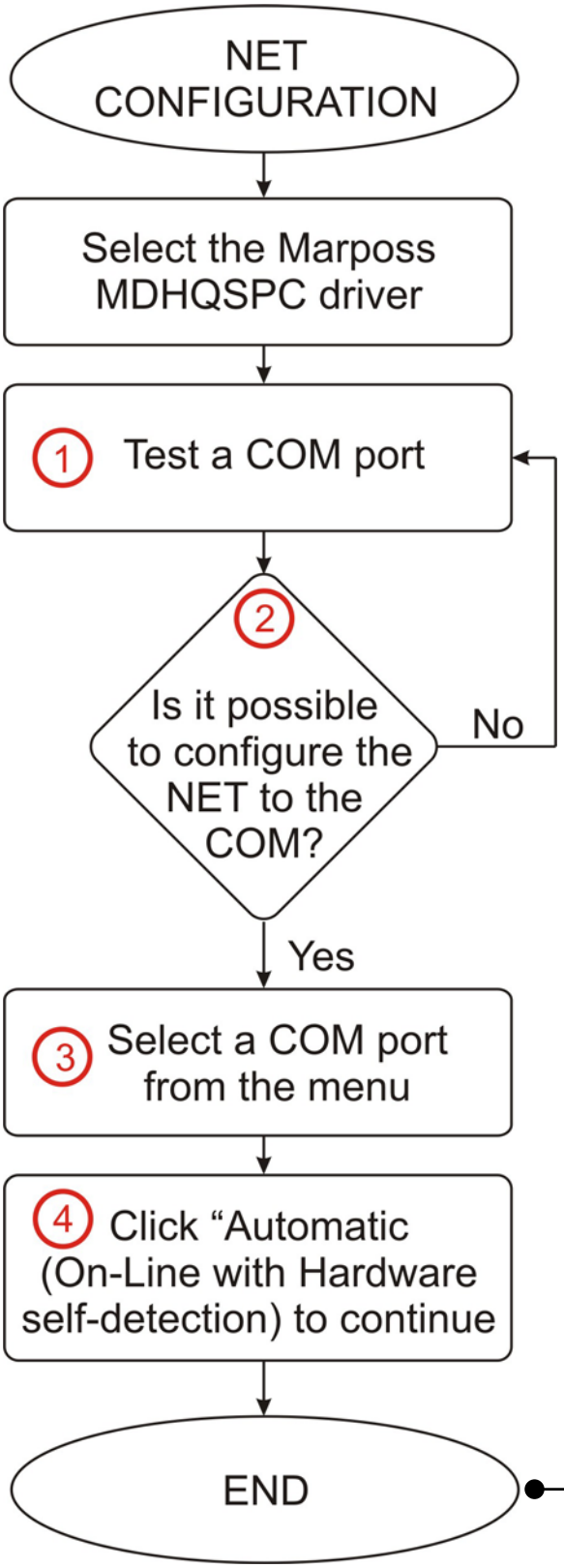



MARPOSS S.p.A.
File Users Net Windows Options Help
1
7
Net.01 - 07DN3751--
3
Unit.03 / Net.01
4
Unit.03[03] / Net.01
Measure Mode
relative
Range
5.000
[mm]
Sensibility
115.000
[mV/mm/V]
Sensibility Adjust
1.00000
Pre-Travel
ON
OFF
[mm]
Extra-Travel
ON
OFF
[mm]
Linearization
ON
OFF
Retentive Data
ON
OFF
Unit.01 / Net.01
74
#1: Tr. Not Connected .
2
Unit.02 / Net.01
Group
Sensor
Direction
Serial Number
Unit
Sw Version
Enable
Label
Arm Ratio
Db
5
6
Save
Abort
Ok

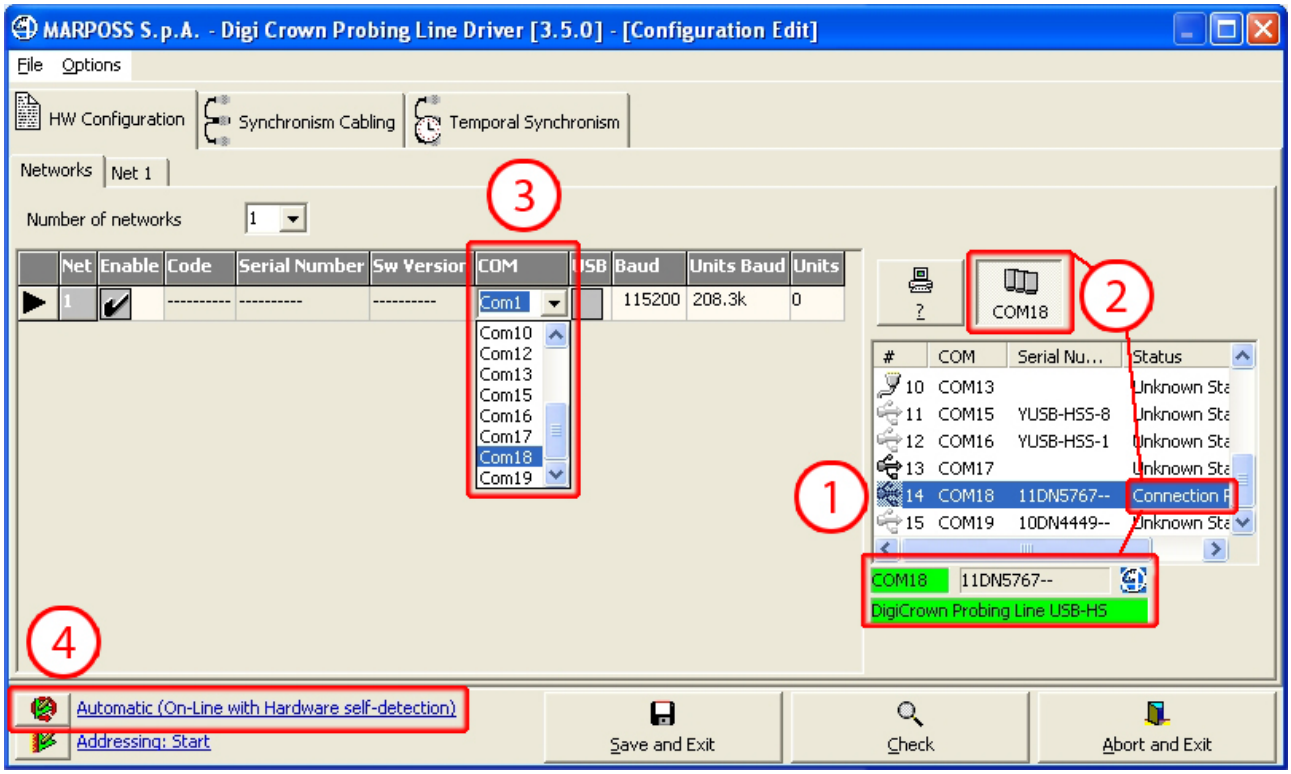

MARPOSS S.p.A.
File Users Net Windows Options Help
New Ctrl+N
Edit Ctrl+E
Open Ctrl+O
SaveAs Ctrl+S
Close Ctrl+C
Exit Alt+F4
1
8
Unit.01 / Net.01
Unit.02 / Net.01
Unit.03 / Net.01

3.2 Semplified Interface: Tabled Only

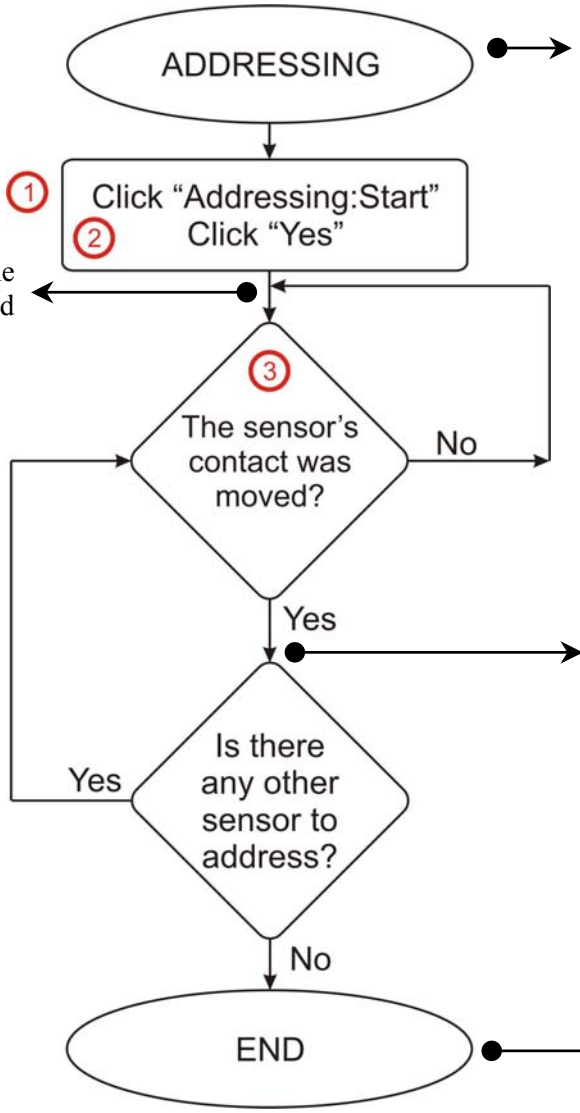
3.2.1 Configuration



Now it is possible to start the addressing procedure (Next paragraph); or to start the On-line mode.


MARPOSS S.p.A. - Digi Crown Probing Line Driver [3.5.0] - [Configuration Edit]
File
Options
HW Configuration
Synchronism Cabling
Temporal Synchronism
Networks
Net 1
Number of networks
1
Net
Enable
Code
Serial Number
Sw Version
COM
USB
Baud
Units Baud
Units
1
115200
208.3k
0
Com1
Com10
Com12
Com13
Com15
Com16
Com17
Com18
Com19
3
?
COM18
2
#
COM
Serial Nu...
Status
10 COM13
11 COM15 YUSB-HSS-8
12 COM16 YUSB-HSS-1
13 COM17
14 COM18 11DN5767--
15 COM19 10DN4449--
1
COM18
11DN5767--
DigiCrown Probing Line USB-HS
4
Automatic (On-Line with Hardware self-detection)
Addressing: Start
Save and Exit
Check
Abort and Exit

3.2.2 Addressing

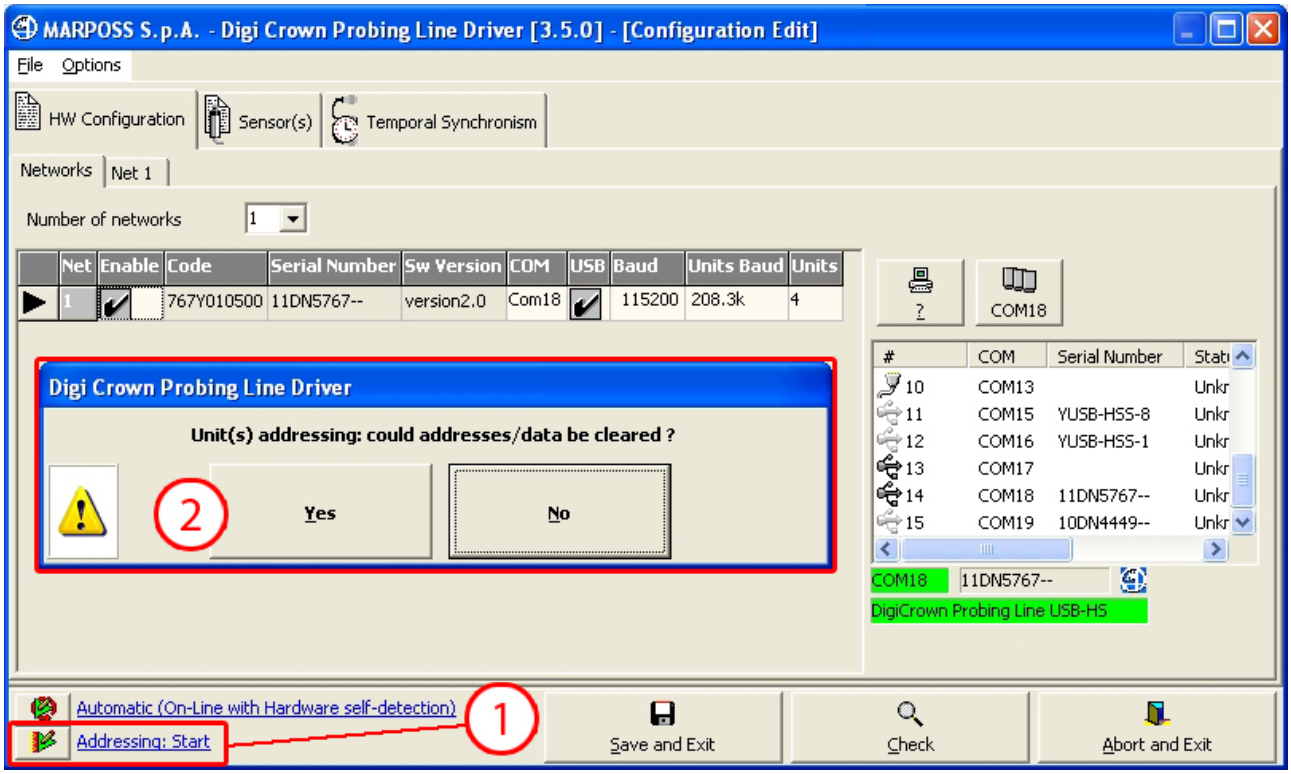


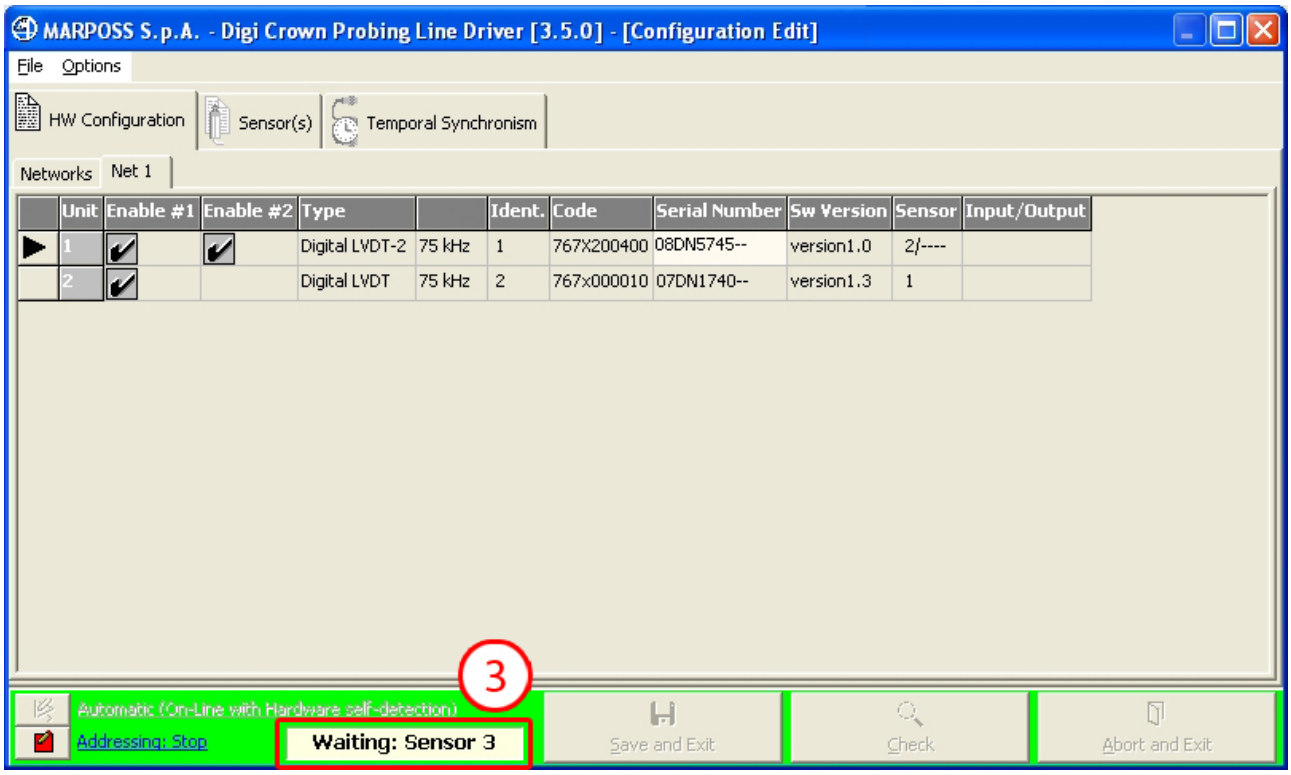
The addressing procedure can also be executed through QuickSPC/Fixture programmer application using the “Sensor Numbers Wizard”

The software waits the sensor’s contact to be moved for addressing.

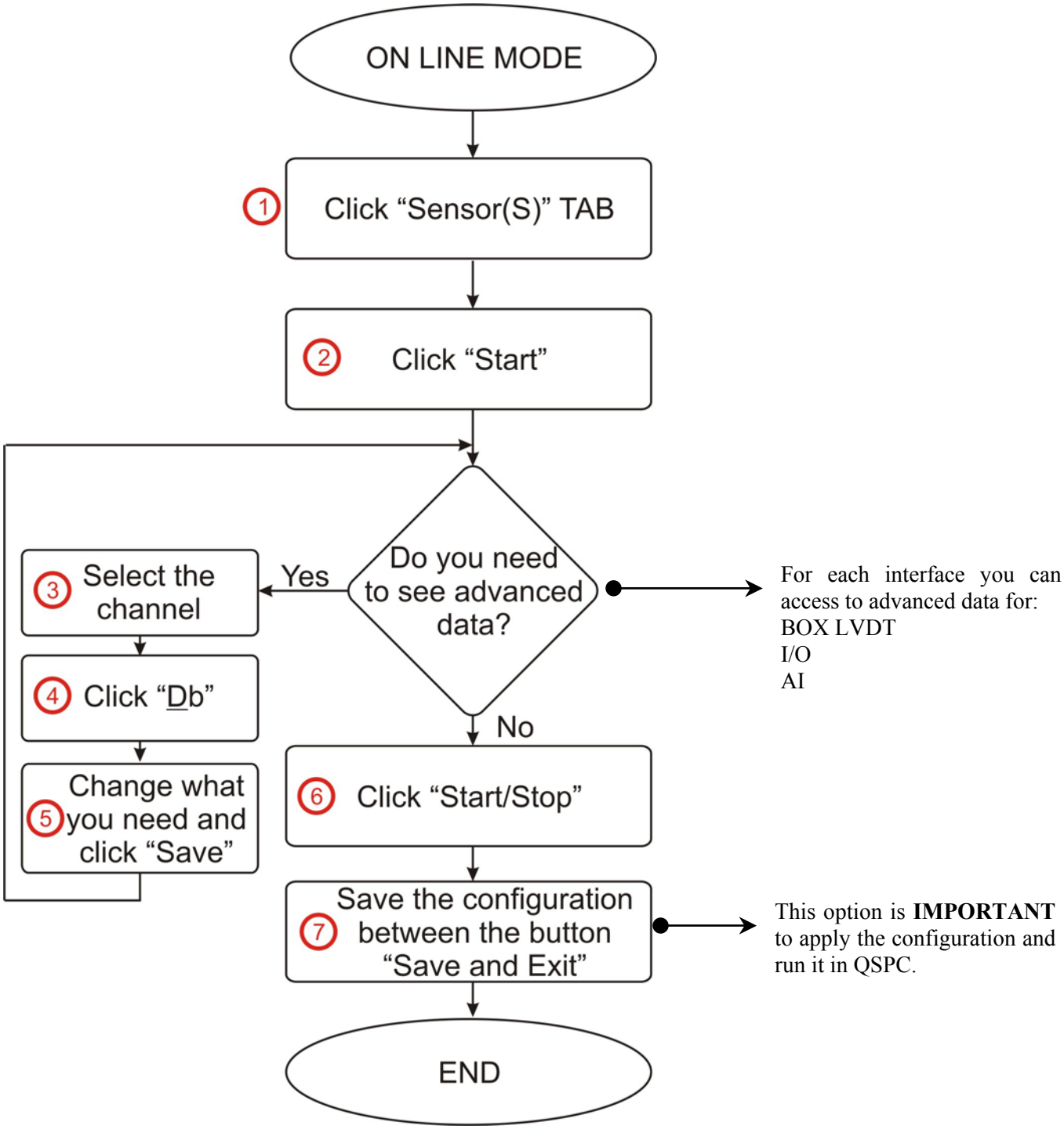
The software recognized and stored the just addressed sensor.

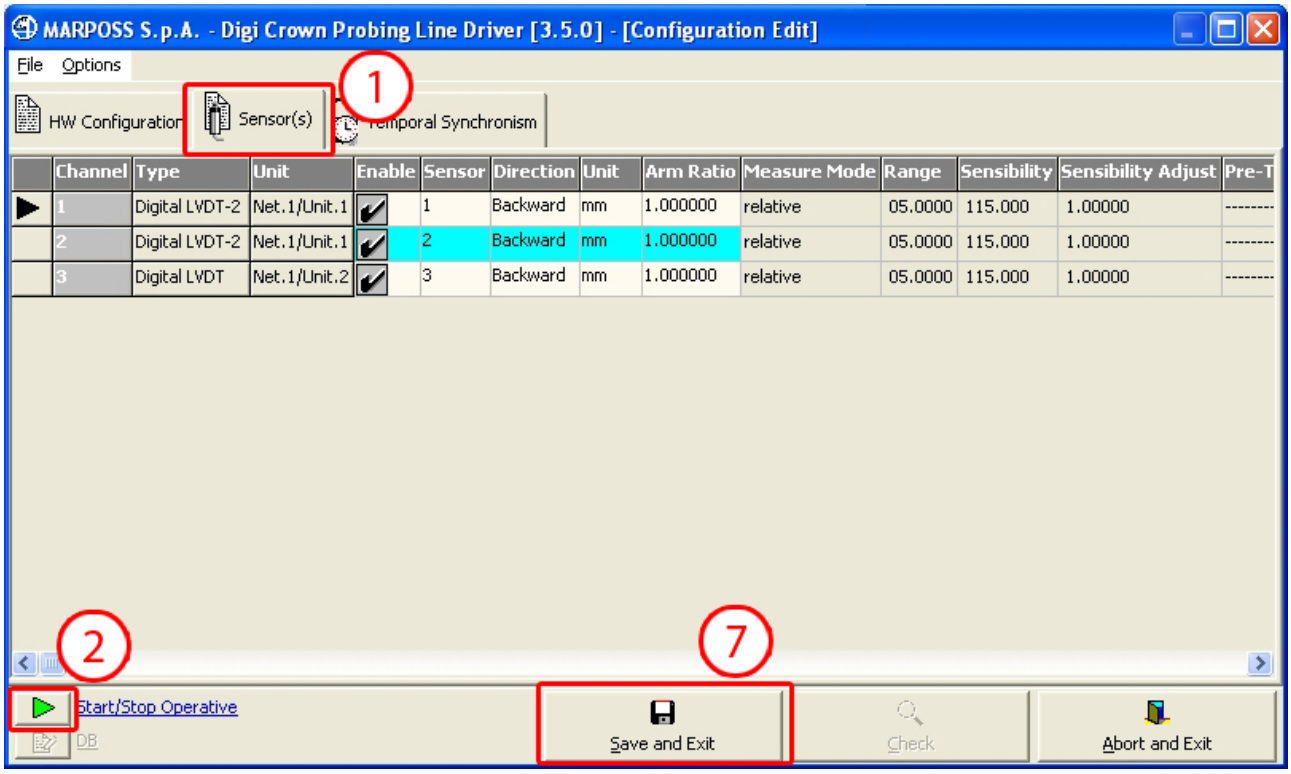
Now it is possible to start the On-line mode.
It is important to run the On-Line mode to apply the configuration and all the data.

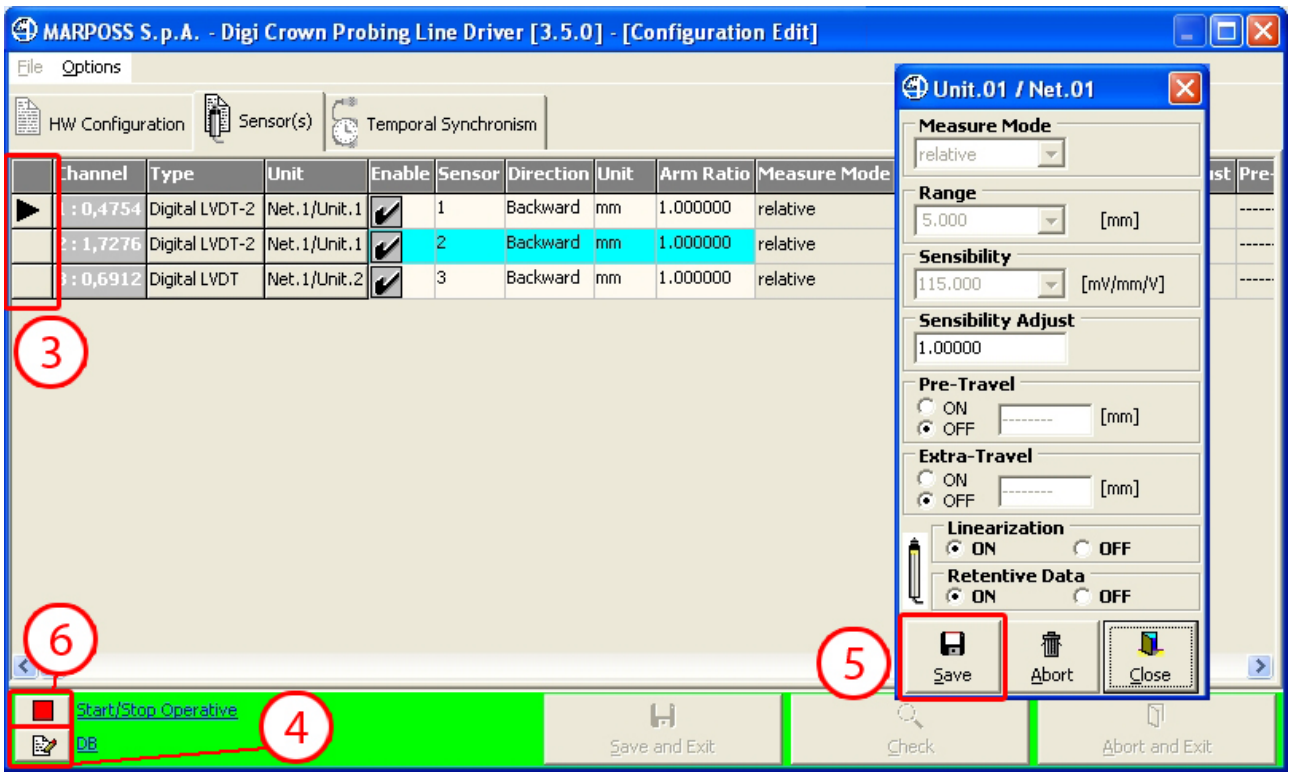

MARPOSS S.p.A. - Digi Crown Probing Line Driver [3.5.0] - [Configuration Edit]
File Options
HW Configuration
Sensor(s)
Temporal Synchronism
Networks
Net 1
Number of networks
1
Net Enable Code Serial Number Sw Version COM USB Baud Units Baud Units
1 767Y010500 11DN5767-- version2.0 Com18 115200 208.3k 4
?
COM18
COM Serial Number
10 COM13
11 COM15 YUSB-HSS-8
12 COM16 YUSB-HSS-1
13 COM17
14 COM18 11DN5767--
15 COM19 10DN4449--
COM18
11DN5767--
DigiCrown Probing Line USB-HS
Digi Crown Probing Line Driver
Unit(s) addressing: could addresses/data be cleared ?
2
Yes
No
Automatic (On-Line with Hardware self-detection)
Addressing: Start
1
Save and Exit
Check
Abort and Exit


MARPOSS S.p.A. - Digi Crown Probing Line Driver [3.5.0] - [Configuration Edit]
File Options
HW Configuration
Sensor(s)
Temporal Synchronism
Networks
Net 1
Unit Enable #1 Enable #2 Type Ident. Code Serial Number Sw Version Sensor Input/Output
1 Digital LVDT-2 75 kHz 1 767X200400 08DN5745-- version1.0 2/----
2 Digital LVDT 75 kHz 2 767x000010 07DN1740-- version1.3 1
3
Automatic (On-Line with Hardware self-detection)
Addressing: Stop
Waiting: Sensor 3
Save and Exit
Check
Abort and Exit

3.2.3 On-line mode




MARPOSS S.p.A. - Digi Crown Probing Line Driver [3.5.0] - [Configuration Edit]
File
Options
HW Configuration
Sensor(s)
Temporal Synchronism
1
Channel | Type | Unit | Enable | Sensor | Direction | Unit | Arm Ratio | Measure Mode | Range | Sensibility | Sensibility Adjust | Pre-T
1 | Digital LVDT-2 | Net.1/Unit.1 | 1 | Backward | mm | 1.000000 | relative | 05.0000 | 115.000 | 1.00000 | --------
2 | Digital LVDT-2 | Net.1/Unit.1 | 2 | Backward | mm | 1.000000 | relative | 05.0000 | 115.000 | 1.00000 | --------
3 | Digital LVDT | Net.1/Unit.2 | 3 | Backward | mm | 1.000000 | relative | 05.0000 | 115.000 | 1.00000 | --------
2
7
Start/Stop Operative
DB
Save and Exit
Check
Abort and Exit


MARPOSS S.p.A. - Digi Crown Probing Line Driver [3.5.0] - [Configuration Edit]
File
Options
HW Configuration
Sensor(s)
Temporal Synchronism
Channel | Type | Unit | Enable | Sensor | Direction | Unit | Arm Ratio | Measure Mode
1 : 0,4754 | Digital LVDT-2 | Net.1/Unit.1 | 1 | Backward | mm | 1.000000 | relative
2 : 1,7276 | Digital LVDT-2 | Net.1/Unit.1 | 2 | Backward | mm | 1.000000 | relative
3 : 0,6912 | Digital LVDT | Net.1/Unit.2 | 3 | Backward | mm | 1.000000 | relative
3
Unit.01 / Net.01
Measure Mode
relative
Range
5.000
[mm]
Sensibility
115.000
[mV/mm/V]
Sensibility Adjust
1.00000
Pre-Travel
ON
OFF
[mm]
Extra-Travel
ON
OFF
[mm]
Linearization
ON
OFF
Retentive Data
ON
OFF
Save
Abort
Close
5
6
Start/Stop Operative
DB
4
Save and Exit
Check
Abort and Exit

4 Configuration: “Complete” Interface – Graphic Mode

When MDHQSPC Driver Programmer starts with an empty configuration loaded it shows an option panel that allows you to select the mode for hardware configuration setup.

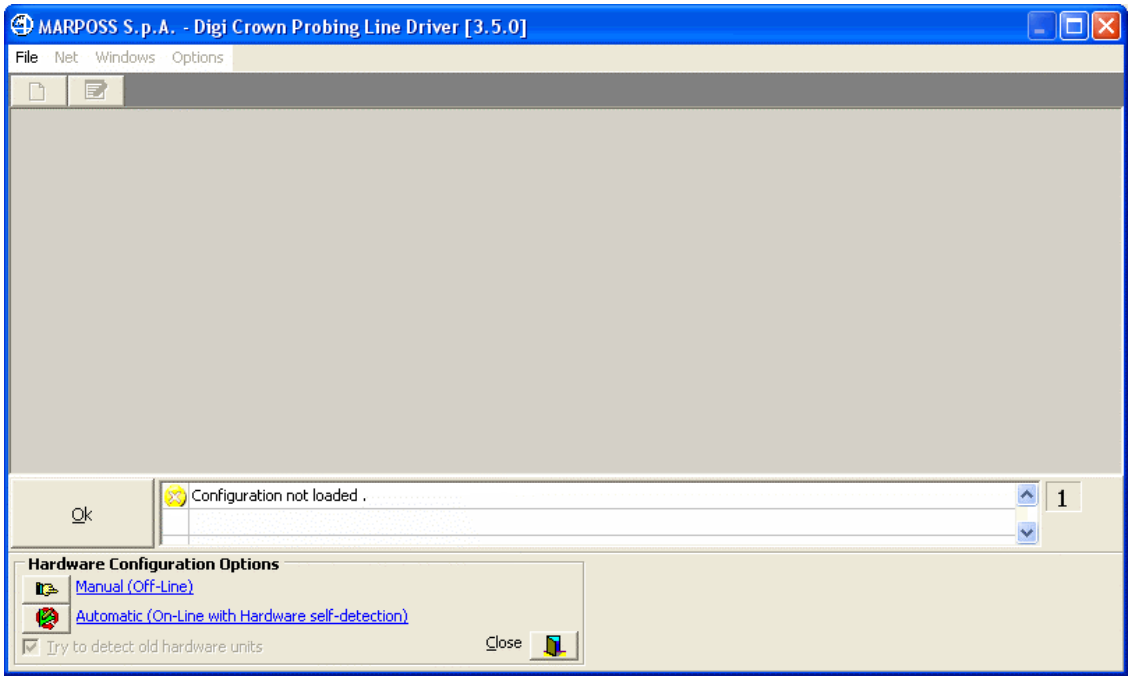


Figure 1: MDHQSPC Driver Programmer, complete interface layout
(Example with empty configuration loaded)

The modes for hardware configuration setup are:

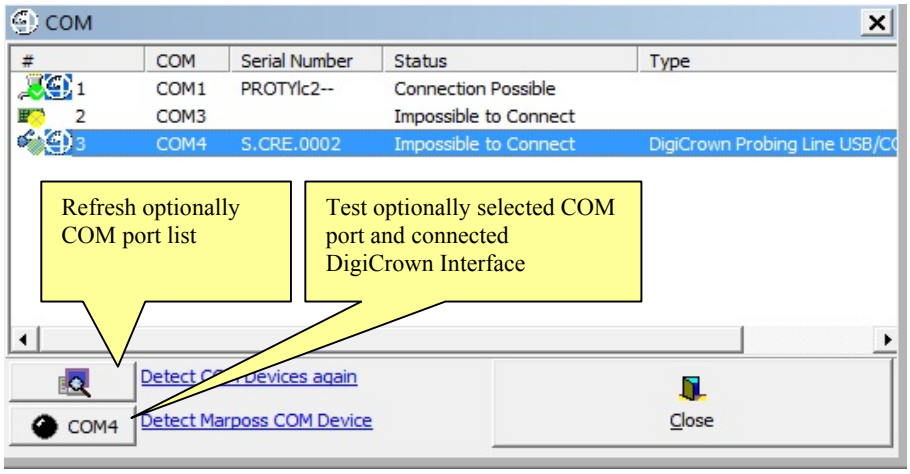
- **Manual (Off-line) -** User designs hardware configuration and programs parameters manually: since configuration can be completed and saved without any request to connect hardware, this option allows user to set up a complete configuration offline.
- **Automatic (On-line with Hardware self-detection) -** Hardware is automatically recognised and acquired without any intervention by the side of user.

4.1 Manual configuration (Off-line)

This mode allows you to perform manual design of hardware configuration: since it can be completed and saved without any request of hardware connection, manual setup is completely **off –line**.

4.1.1 Test COM port

If hardware is available during setup you can connect it and test its connection. A panel shows available COM ports; a button allows you to test COM and identify the device connected to the COM port (leds on DigiCrown Box are turned on when test button is pressed).
After test COM status is reported.

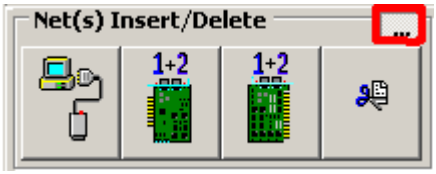


Status	Description
Unknown Status	COM port has not been tested
Connection possible	DigiCrown Probing Line Interface device is connected to the COM port and ready to use it. SERIAL NUMBER is showed.
Impossible to connect	No DigiCrown Probing Line Interface device is connected to the COM port
Not operative	Unable to open COM port

4.1.2 Net(s) Insert/Delete

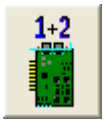
Insert all the DigiCrown Probing Line Interfaces (here called *Net*) you want to use in your configuration.
A Net(s) Insert/Delete panel allows to insert and remove a Net (with a generic interface type):

Using a generic interface type does not involve any limitation and configuration on any type of interface. If allows you to drive interface type, enter the ***advanced mode*** you want to specify corner button:
by pressing top-right

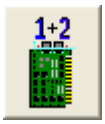


Net(s) Insert/Delete

Inserts a COM Interface
(1 Net inserted on 1 COM port , real RS232 or virtual USB one)



Inserts a PCI Card
(2 Nets inserted on 2 different COM ports)



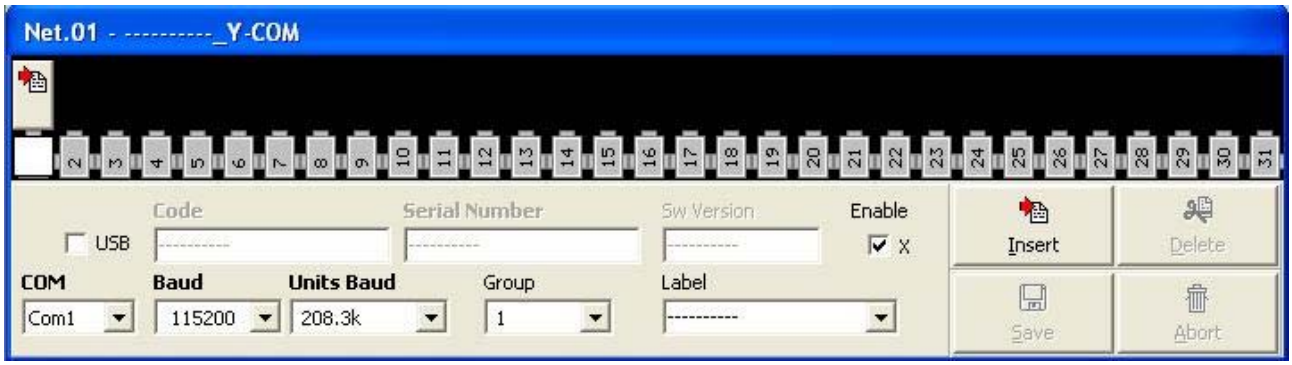
Inserts a ISA Card
(2 Nets inserted on 2 different COM ports)

Removes the last Net(s) inserted
(last one if COM interface, last two if PCI or ISA Card)

The maximum number of Nets supported into a single configuration is 12.

4.1.3 Net Configuration

When Net insertion has been completed a net configuration panel has been created for each net; use this panel to set up net configuration:



USB CheckBox.

Interface USB Flag.
To be checked if Interface is USB/COM type.
USB flag checking let system to Play&Play Interface on its connection.
Default state is *off*.

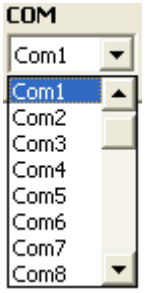
Production Codes.

Interface Code. (Read Only)
Self-acquired within Addressing session in On-Line session (see _Addressing Session).

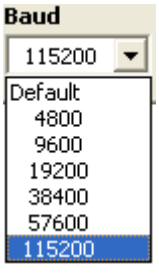
Interface Serial Number. (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Interface Software Version. (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

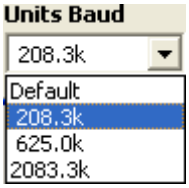
Communication Parameters.



COM port related to serial line communication between Host Station and Net.
Host Station always views a Net trough a standard COM port.
COM selection is possible aside from current Host Station COM port capability.



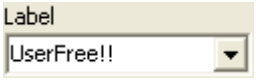
Baud of RS232 communication between Host Station and Net.
Baud values are standard:4800, 9600, 19200, 38400, 57600, 115200 bit/s.
Default Baud value is 9600.
If RS232 cable length is not excessive, a high Baud (**115200** bit/s) is to be preferred.



Baud of RS485 communication of internal Network, between Interface Station and Unit(s).
Default Baud value is 9600.
If RS485 cable length is not excessive, "**208.3k**" Baud is to be preferred independently of Interface and DigiBox versions *(supported in any case*).
If RS485 cable length is not excessive, "**625.0k**" Baud is to be preferred if Interface and all DigiBox versions are at least **A3.x**.
If RS485 cable length is not excessive, "**2083.3k**" Baud is to be preferred if Interface and all DigiBox versions are at least **A4.x**.

Free for User parameters.

Interface Group.
Interface Group programming (from 1 to 99) is free for user.
It is a numeric field.

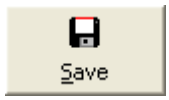


Interface Label.
10 characters length string, free for user.
It is a alpha-numeric field.

On-Line Enable.

Interface Enable.
Allow globally Net to start the On-Line mode.
Default state is *enabled.*

Save / Abort.



Before saving your configuration you have to save changes on single Net configuration.
This button enables to save changes on single Net configuration.

This button enables to abort changes on single Net configuration, with reloaded of old data.

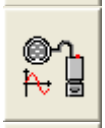
4.1.4 Unit(s) Insert/Delete

Insert all the DigiCrown Probing Line Box (here called *Unit*) that you want to use in each Net. To perform a unit insertion first you have to select the type of Unit station by Unit(s) Select buttons on Hardware Configuration Panel.

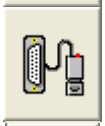
Unit(s) Select

Selects a **LVDT Unit** for subsequent inserting (default).

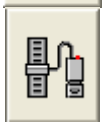
Selects a **LVDT-2 Unit** for subsequent inserting



Selects an **Analogic Input Unit** for subsequent inserting.

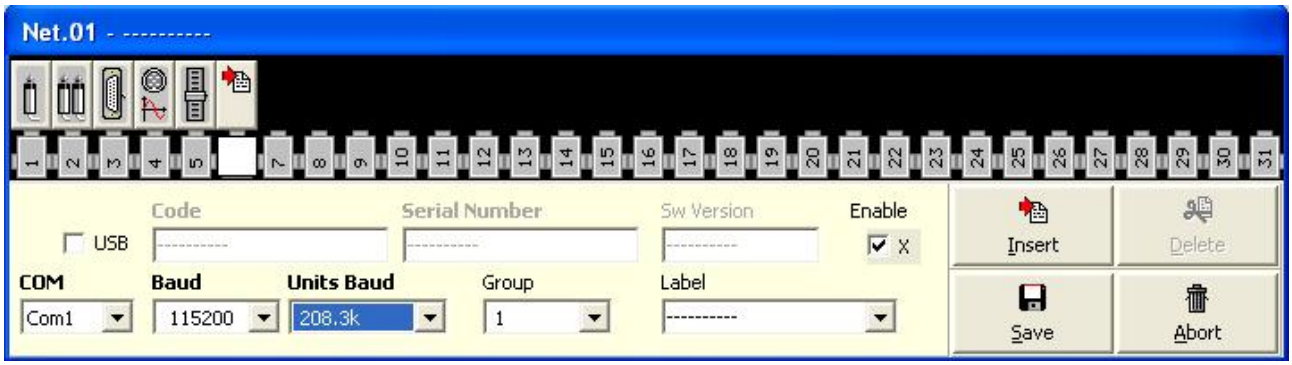


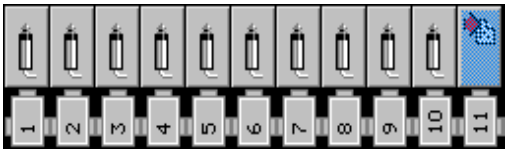
Selects a **I/O Unit** for subsequent inserting.

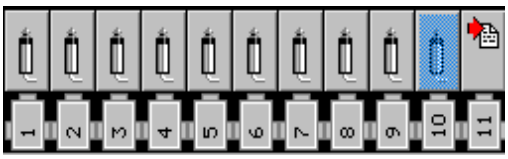


Selects a **Digital** or **Analog Incremental Encoder Unit** for subsequent inserting.

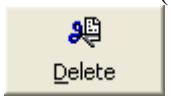
After you have selected unit type, press Insert or Delete button into the Net Panel to insert or remove units.







Insert Unit: the operation is enabled only at the first free location (see figure on the left)



Delete Unit: the operation is enabled only at the last occupied location (see figure on the left).

The maximum number of Units supported into a single Net is 31.

4.1.5 LVDT Unit Configuration


Button indicates a LVDT unit. Click mouse on it to toggle on/off the LVDT Unit Form.

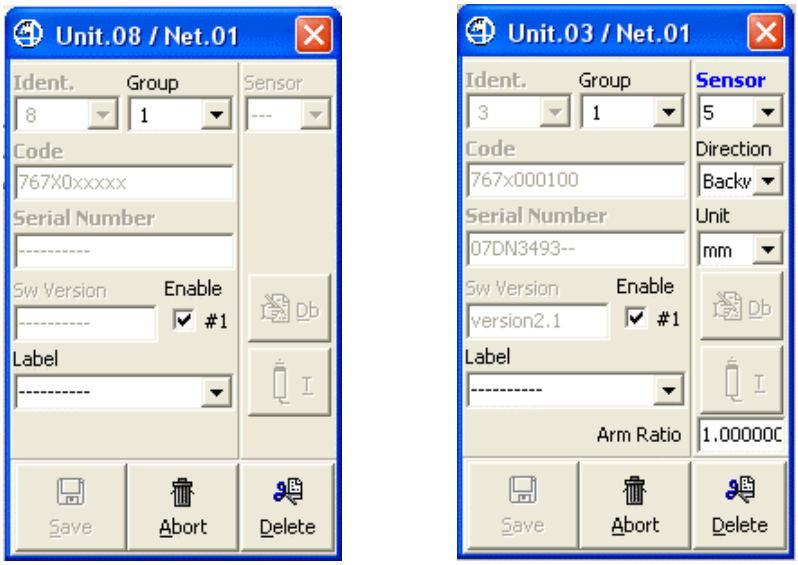
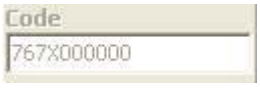


Figure 2: LVDT Unit Form
(example for a new unit in Off-Line mode , example for a just existing unit in Off-Line mode)

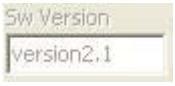
LVDT Unit Form let user to configure the LVDT Unit.
A brief explanation of parameters and panel buttons is reported below.

Production Codes



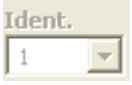
Unit Code. (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Unit Serial Number (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).



Unit Software Version (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Identification Number : Logic Address for communicate with Unit



Unit Identification Number (Read Only)
Identification Number is the Unit logic Address unique in network: it is necessary for communicate with Unit.
Identification Number is self-assigned and automatically downloaded into Unit by Tool itself during On-Line Addressing session.

Sensor Channel parameters.

not assigned

just assigned

Sensor Number.
Sensor Number has to be programmed or is self-assigned within On-Line Addressing session in order to define the flat mapping of measure points.
Sensor Number is null when Unit is inserted.
Sensor Number could be changed if just assigned by a previously Addressing session.

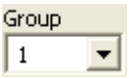
Move mouse on  in order to see this information.

Sensor Direction (sign convention).
- Backward (default)
- Forward

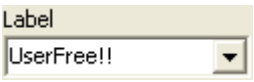
Sensor Measure Unit .
- millimeters (default)
- degrees
- Celsius degrees
- grams

Sensor Arm Ratio (unsigned) .
- from 0.5 to 4.0 (1.0 default)

Free for User parameters.



Unit Group.
Unit Group programming (from 1 to 99) is free for user.
It is a numeric field.

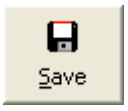


Unit Label.
Unit Label is 10 characters length string free for user.
It is a alpha-numeric field.

On-Line Enable

Unit Enable.
Enables LVDT unit to start the On-Line mode.
Default state is *enabled*

Save and Exit , Abort and Exit , Delete Data



This button **Saves changes** to the current configuration.
Unit is closed.

This button **Aborts changes**, with reloaded of old data.
Unit is closed.

This button **Deletes relevant data:**

- **Code** , **Serial Number , Sw Version**
- **Sensor** and **Sensor Direction**

Unit is not closed.

4.1.6 LVDT-2 Unit Configuration

 Button indicates a LVDT-2 unit. Click mouse on it to toggle on/off the LVDT-2 Unit Form.

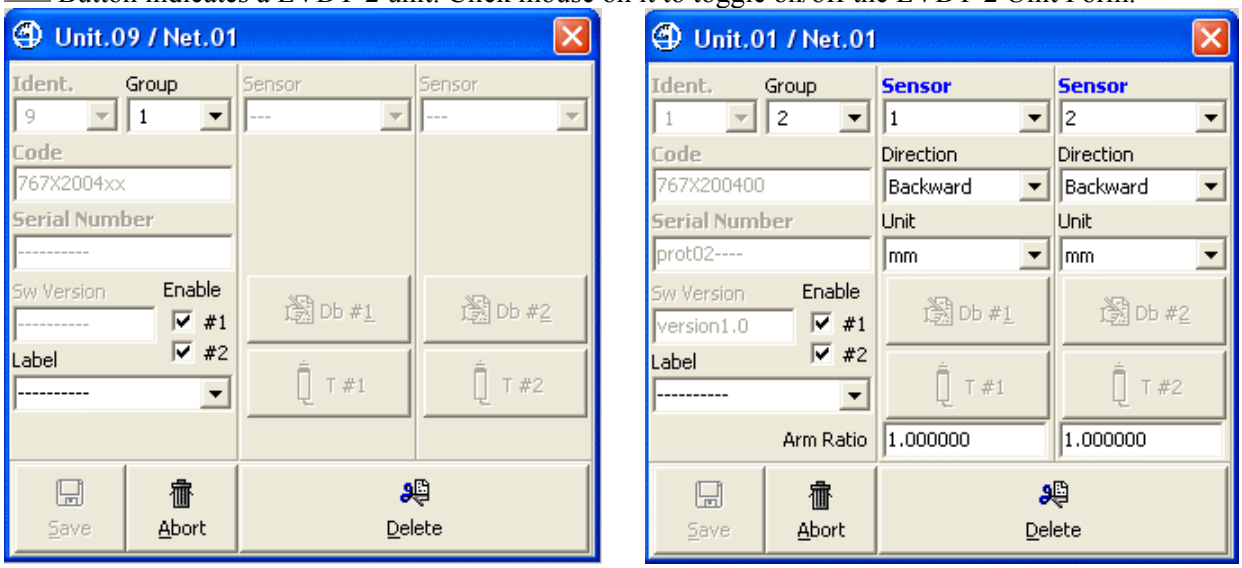


Figure 3: LVDT-2 Unit Form
(example for a new unit in Off-Line mode , example for a just existing unit in Off-Line mode)

LVDT-2 Unit Form let user to configure the LVDT-2 Unit.
A brief explanation of parameters and panel buttons is reported below.

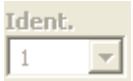
Production Codes

Unit Code. (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Unit Serial Number (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Unit Software Version (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Identification Number : Logic Address for communicate with Unit



Unit Identification Number (Read Only)
Identification Number is the Unit logic Address unique in network: it is necessary for communicate with Unit.
Identification Number is self-assigned and automatically downloaded into Unit by Tool itself during On-Line Addressing session.

In LVDT-2 unit form, 2 sensors are present: the one on the left is referred to channel 1 and the one on the right is referred to channel 2.

Sensor Channel parameters.

not assigned

just assigned

Sensor Number.
Sensor Number has to be programmed or is self-assigned within On-Line Addressing session in order to define the flat mapping of measure points.
Sensor Number is null when Unit is inserted.
Sensor Number could be changed if just assigned by a previously Addressing session.

Move mouse on  in order to see this information.

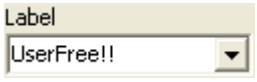
Sensor Direction (sign convention).
- Backward (default)
- Forward

Sensor Measure Unit .
- millimeters (default)
- degrees
- Celsius degrees
- grams

Sensor Arm Ratio (unsigned) .
- from 0.5 to 4.0 (1.0 default)

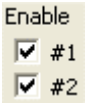
Free for User parameters.

Unit Group.
Unit Group programming (from 1 to 99) is free for user.
It is a numeric field.



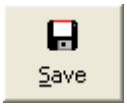
Unit Label.
Unit Label is 10 characters length string free for user.
It is a alpha-numeric field.

On-Line Enable



Unit Enable.
Enables LVDT-2 unit to start the On-Line mode. It is possible to enable only one channel per module (#1 or #2).
Default state is *enabled.*

Save and Exit , Abort and Exit , Delete Data



This button **Saves changes** to the current configuration.
Unit is closed.

This button **Aborts changes**, with reloaded of old data.
Unit is closed.

This button **Deletes relevant data:**
- **Code** , **Serial Number , Sw Version**
- **Sensor** and **Sensor Direction**

Unit is not closed.

4.1.7 I/O Unit Configuration


Button indicates an I/O unit.
Click mouse on it to toggle on/off the I/O Unit Form.

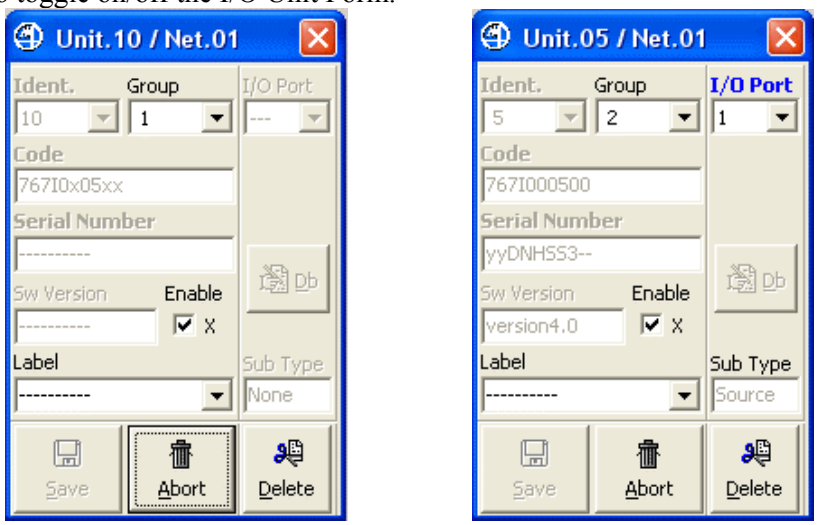


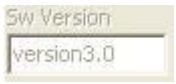
Figure 4: I/O Unit Form
(example for a new unit , example for a just existing unit)

I/O Unit Form let user to configure the I/O Unit.
A brief explanation of parameters and panel buttons is reported below.

Production Codes

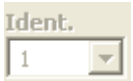
Unit Code. (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Unit Serial Number (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).



Unit Software Version (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

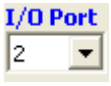
Identification Number : Logic Address for communicate with Unit



Unit Identification Number (Read Only)
Identification Number is the Unit logic Address unique in network: it is necessary for communicate with Unit.
Identification Number is self-assigned and automatically downloaded into Unit by Tool itself during On-Line Addressing operation.

Input and Output Channel parameters.

not assigned

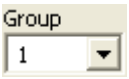


just assigned

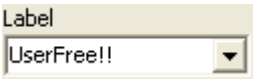
Input/Output Channel Number.
Input/Output Number has to be programmed or is self-assigned within On-Line Addressing session in order to define the flat mapping of Input/Output Ports.
Input/Output Port is null when Unit is inserted.
Input/Output Port could be changed if just assigned by a previously Addressing session.

Move mouse on  in order to see these information.

Free for User parameters.



Unit Group.
Unit Group programming (from 1 to 99) is free for user.
It is a numeric field.

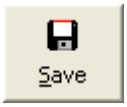


Unit Label
Unit Label is 10 characters length string free for user.
It is a alpha-numeric field.

On-Line Enable.

Unit Enable.
Enables I/O unit to start the On-Line mode.
Default state is *enabled.*

Save and Exit , Abort and Exit , Delete Data



This button **Saves changes** to the current configuration.
Unit is closed.

This button **Aborts changes**, with reloaded of old data.
Unit is closed.

This button **Deletes relevant data:**
- **Code** , **Serial Number , Sw Version**
- **Input** and **Output**

Unit is not closed.

4.1.8 Analogic Input Unit Configuration


Button indicates an Analogic Input unit.
Click mouse on it to toggle on/off the Analogic Input Unit Form.

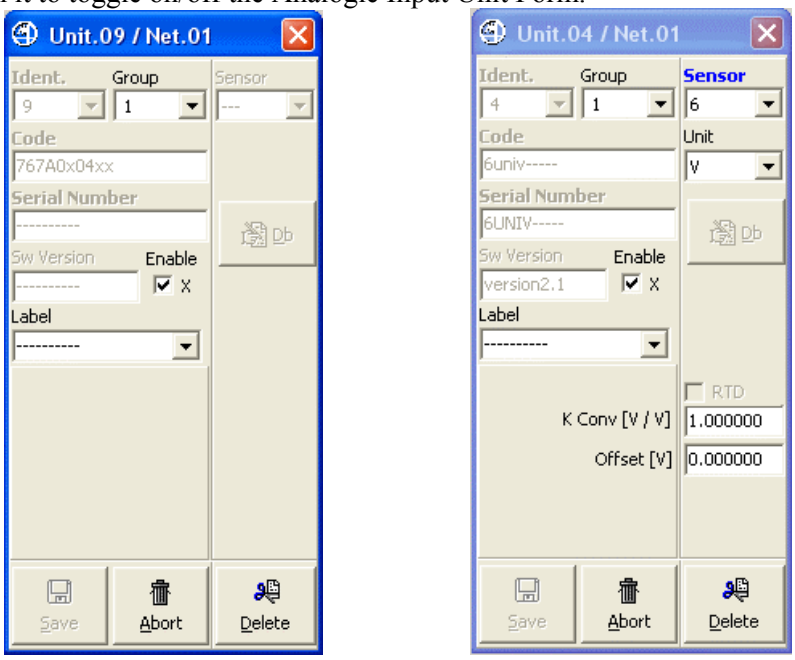
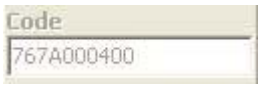


Figure 5: Analogic Input Unit Form
(example for a new unit in Off-Line mode , example for a just existing unit in Off-Line mode)

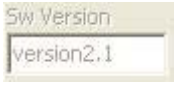
Analogic Input Unit Form let user to configure the Analogic Input Unit.
A brief explanation of parameters and panel buttons is reported below.

Production Codes



Unit Code. (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Unit Serial Number (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).



Unit Software Version (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Identification Number : Logic Address for communicate with Unit

Unit Identification Number (Read Only)
Identification Number is the Unit logic Address unique in network: it is necessary for communicate with Unit.
Identification Number is self-assigned and automatically downloaded into Unit by Tool itself during On-Line Addressing session.

Sensor Channel parameters.

not assigned

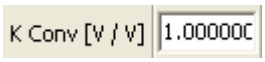
just assigned

Sensor Number.
Sensor Number has to be programmed or is self-assigned within On-Line Addressing session in order to define the flat mapping of measure points.
Sensor Number is null when Unit is inserted.
Sensor Number could be changed if just assigned by a previously Addressing session.

Move mouse on  in order to see this information.

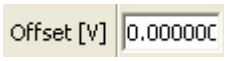
Sensor Measure Unit .
- ----
- millimeters
- degrees
- Celsius degrees
- grams
- newton
- pascal
- volt (default)
- milliampere
- ohm
- N*m
- mm/s^2
- Rad/s
- Rad/s^2
- dm^3/s

RTD Enable (Resitor Temperature Detector)
This option is available only when the sensor type is “Resistance”.
If RTD is disabled the following options are available:

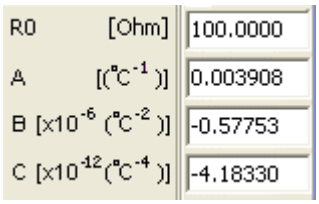


Measure conversion factor (signed) **.**
Depending on selected Sensor Measure Unit
- Selected Sensor Measure Unit /[V]
- Selected Sensor Measure Unit /[Ohm]
- Selected Sensor Measure Unit /[mA]

depending on applicable type



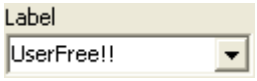
Measure offset (signed) **.**
Depending on selected Sensor Measure Unit
- Selected Sensor Measure Unit



If RTD option is enabled, the parameter for the RTD calculation are available (depends on sensor type).

Free for User parameters.

Unit Group.
Unit Group programming (from 1 to 99) is free for user.
It is a numeric field.

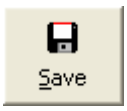


Unit Label.
Unit Label is 10 characters length string free for user.
It is a alpha-numeric field.

On-Line Enable

Unit Enable.
Enables Analogic Input unit to start the On-Line mode.
Default state is *enabled.*

Save and Exit , Abort and Exit , Delete Data



This button **Saves changes** to the current configuration.
Unit is closed.

This button **Aborts changes**, with reloaded of old data.
Unit is closed.

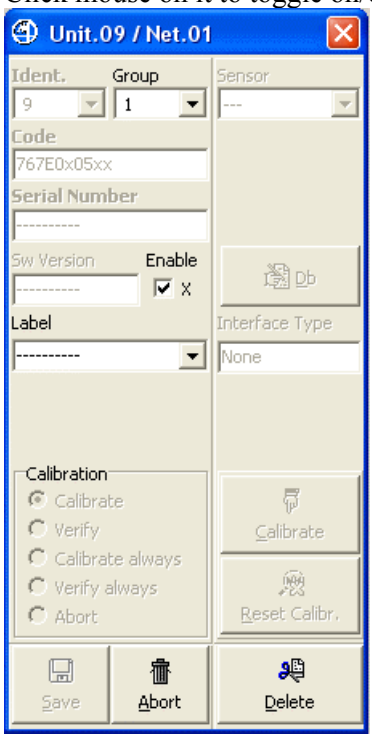
This button **Deletes relevant data:**

- **Code** , **Serial Number , Sw Version**
- **Sensor** and **Sensor Direction**

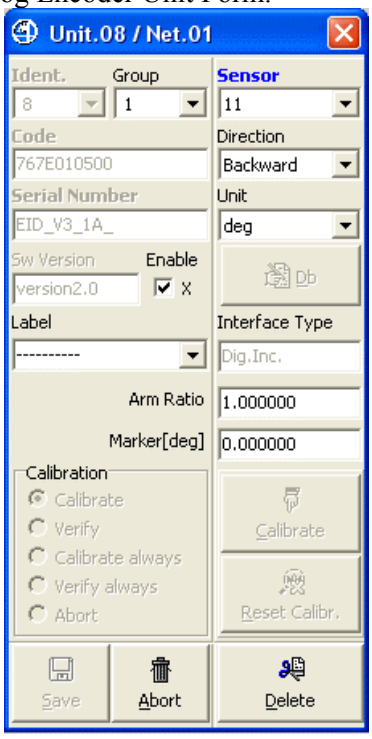
Unit is not closed.

4.1.9 Incremental Digital or Analog Encoder Unit Configuration


Button indicates an Incremental Digital or Analog Encoder Input unit.
Click mouse on it to toggle on/off the Incremental Digital or Analog Encoder Unit Form.



Digital:



Analog:

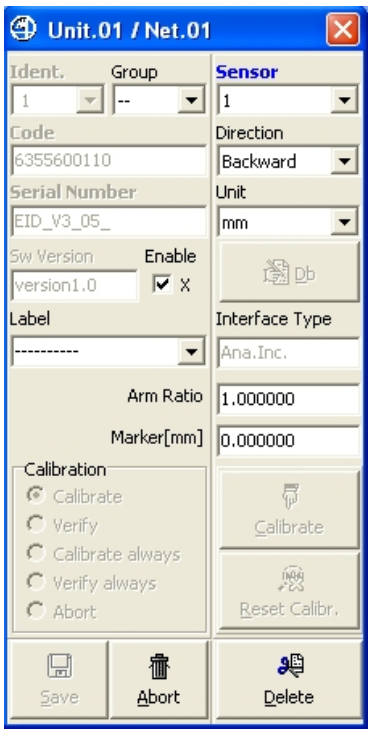
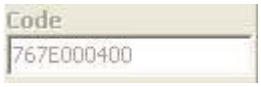


Figure 6: Incremental Digital or Analog Encoder Unit Form
(example for a new unit in Off-Line mode , example for a just existing unit in Off-Line mode)

Incremental Digital or Analog Encoder Unit Form let user to configure the Incremental Digital Encoder Unit.
A brief explanation of parameters and panel buttons is reported below.

Production Codes



Unit Code. **(Read Only)**
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Unit Serial Number (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Unit Software Version (Read Only)
Self-acquired within Addressing session in On-Line mode (see _Addressing Session).

Identification Number : Logic Address for communicate with Unit

Unit Identification Number (Read Only)
Identification Number is the Unit logic Address unique in network: it is necessary for communicate with Unit.
Identification Number is self-assigned and automatically downloaded into Unit by Tool itself during On-Line Addressing session.

Sensor Channel parameters.

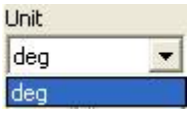
not assigned

just assigned

Sensor Number.
Sensor Number has to be programmed or is self-assigned within On-Line Addressing session in order to define the flat mapping of measure points.
Sensor Number is null when Unit is inserted.
Sensor Number could be changed if just assigned by a previously Addressing session.

Move mouse on  in order to see this information.

Sensor Direction (sign convention).
- Backward (default)
- Forward

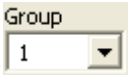


Sensor Measure Unit .
- millimeters
- degrees
- Celsius degrees
- grams

Sensor Arm Ratio (unsigned)
- from 0.5 to 4.0 (1.0 default)

Measure offset (signed)
Depending on selected Sensor Measure Unit and *depending on applicable type*

Free for User parameters.



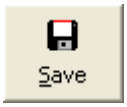
Unit Group.
Unit Group programming (from 1 to 99) is free for user.
It is a numeric field.

Unit Label.
Unit Label is 10 characters length string free for user.
It is a alpha-numeric field.

On-Line Enable

Unit Enable.
Enables Incremental Digital or Analog Encoder unit to start the On-Line mode.
Default state is *enabled.*

Save and Exit , Abort and Exit , Delete Data



This button **Saves changes** to the current configuration.
Unit is closed.

This button **Aborts changes**, with reloaded of old data.
Unit is closed.

This button **Deletes relevant data:**

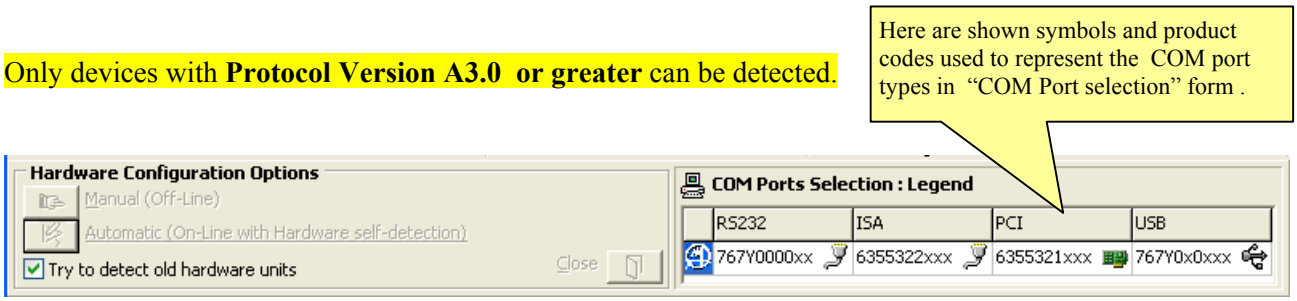
- **Code** , **Serial Number , Sw Version**
- **Sensor** and **Sensor Direction**

Unit is not closed.

4.2 Automatic Configuration (On-line with Hardware self-detection)

This mode allows you to perform a complete hardware setup without any intervention by your side. A totally automatic procedure detect connected devices, acquire their parameters and perform an automatic addressing. After that you can save configuration and it is ready to use.

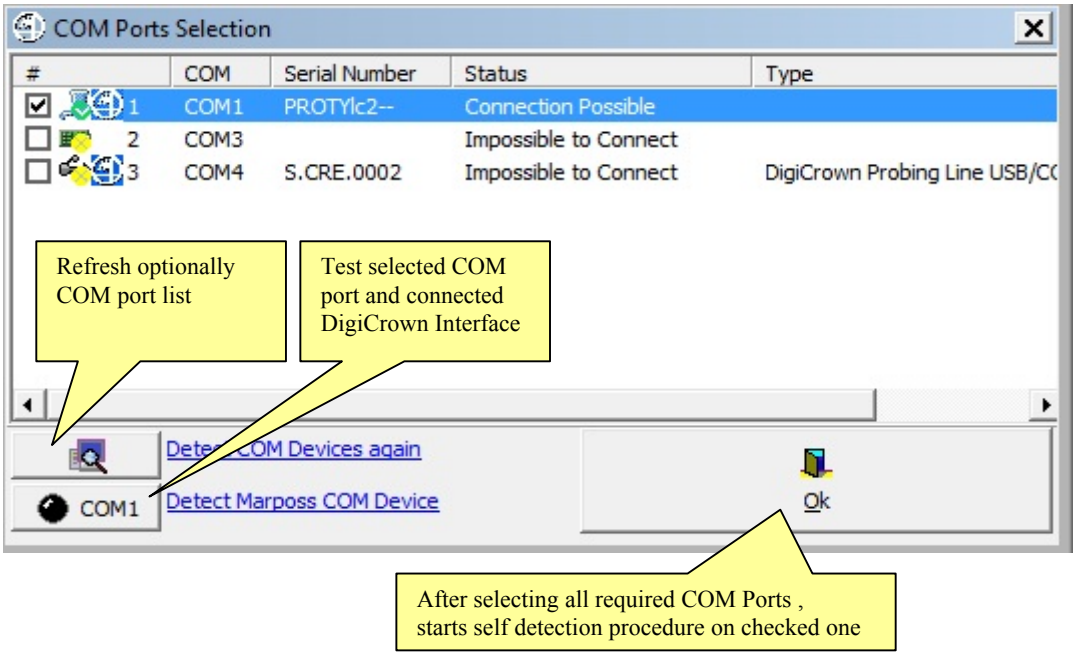
Only devices with **Protocol Version A3.0 or greater** can be detected.



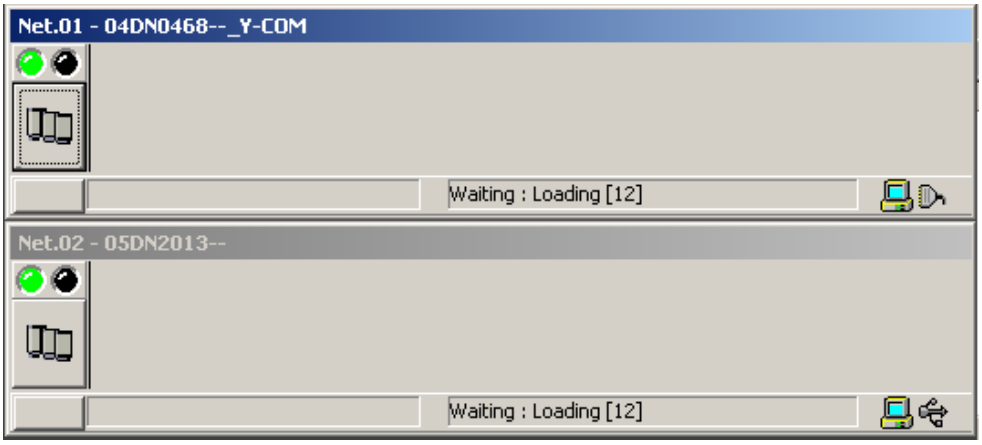
If "Try to detect old hardware units" check box is selected, devices with protocol version less than A3.0 can be acquired only if just properly addressed.
If "Try to detect old hardware units" check box is not selected, only devices with protocol version greater or equal than A3.0 are acquired also if not properly addressed, with very fast timings .

4.2.1 COM Port selection

After devices have been connected, select COM ports (multiple selections are allowed) where self detection procedure will run; you can test port and device connection by press test button.
Press Ok button to start self detection procedure.



Self detection could be a long time procedure (it depends on number of nets and units) , especially if “Try to detect old hardware units” check box was selected: during procedure you can see activity on each net.



When self detection has been completed you can edit or save configuration (please , see paragraph 4.1) or apply it to enter to an on line session (please , see chapter 5).

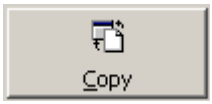
In any case :

- current hardware configuration was automatically self-detected
- all current parameters of all detected devices were automatically self-loaded

4.3 Print configuration

Format and print data.
An error occurs if you don’t have any printer installed.

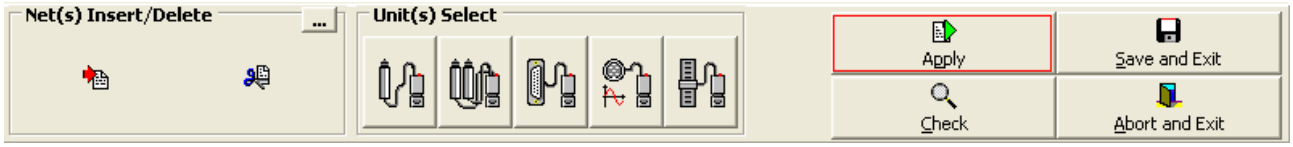
4.4 Copy configuration



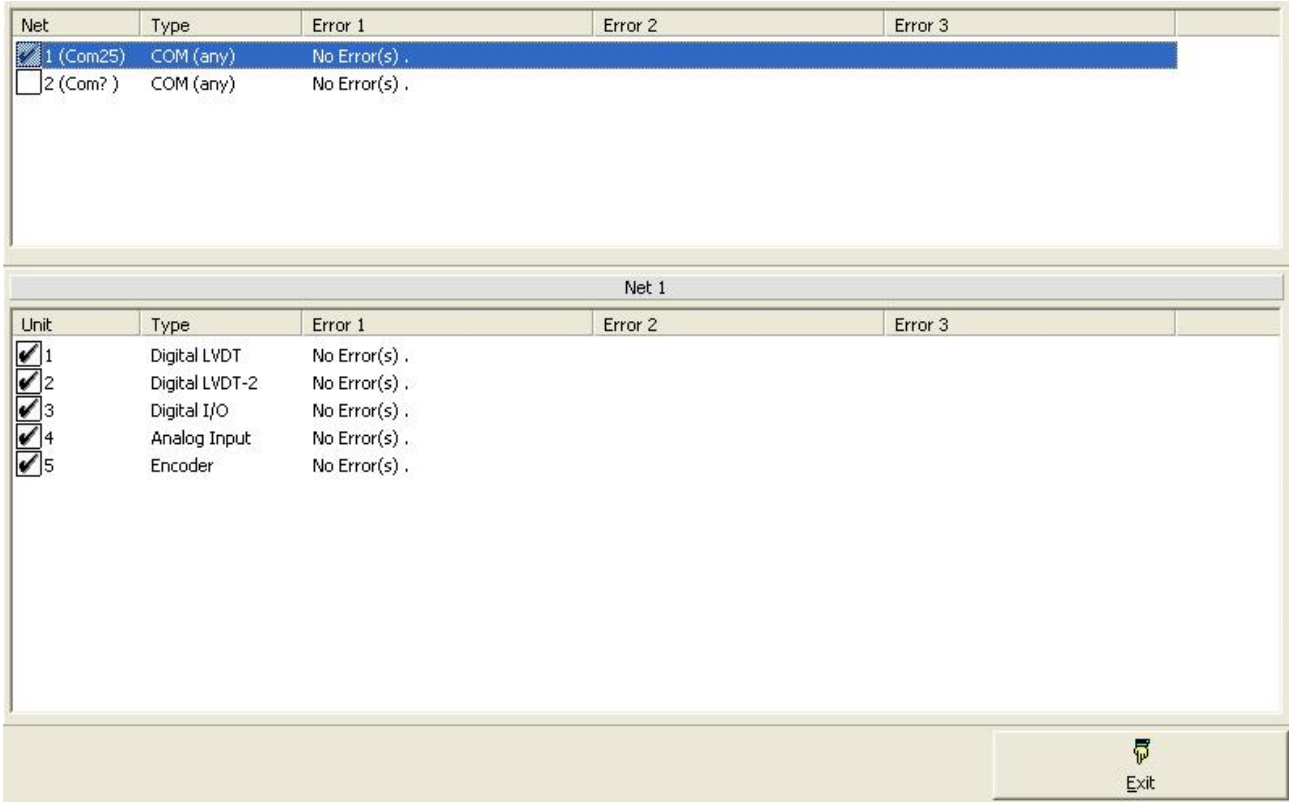
Copy data to clipboard.
Data can be pasted into another application.

4.5 Check Configuration

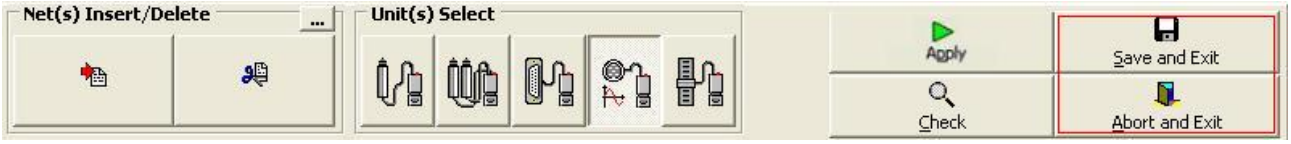
The button signaled below perform an integrity data check on the current configuration.



Check results are showed into an external report panel that lists errors for each net and unit:



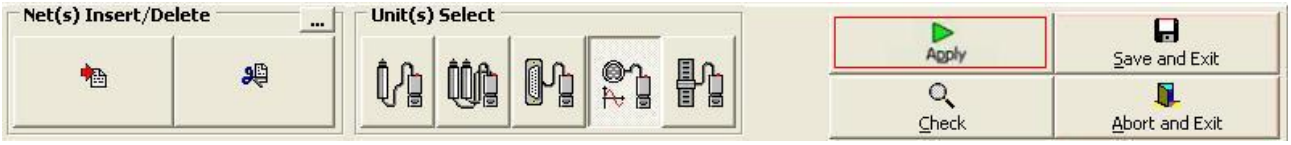
4.6 Save, Abort Configuration



Save and Exit Saves current configuration and exits program

Abort and Exit Exits program without saving current configuration.

4.7 Apply Configuration



Configuration can be **Applied in On-Line** mode in order to:

- start an **Addressing session**, self-acquiring Interface(s) and Unit(s) data and fixing into each Unit an unique network address (Identification Number)
- start a **Check session**, checking if current configuration is proper for self-detected HW
- start a **Download session**, checking if current configuration is proper for self-detected HW and programming HW to match required configuration
- start an **Operative session**, verifying proper functionality of a previously Addressed configuration
- start an Operative session, with set-up of specific parameters inside Unit(s)
- start an Operative session, with view of Unit(s) capability as measure for LVDT-1, LVDT-2, Analogic Input and Incremental Digital or Analog Encoder Units or I/O for I/O Units

On-Line Addressing session is mandatory 1st time a network is equipped or if a change on just Addressed network is operated.

5 Apply Configuration: “Complete” Interface – Graphic Mode

This mode is started after Apply button was pressed.

- Hardware Configuration panel disappears
- On-Line mode is ready to be started without any communication active at now

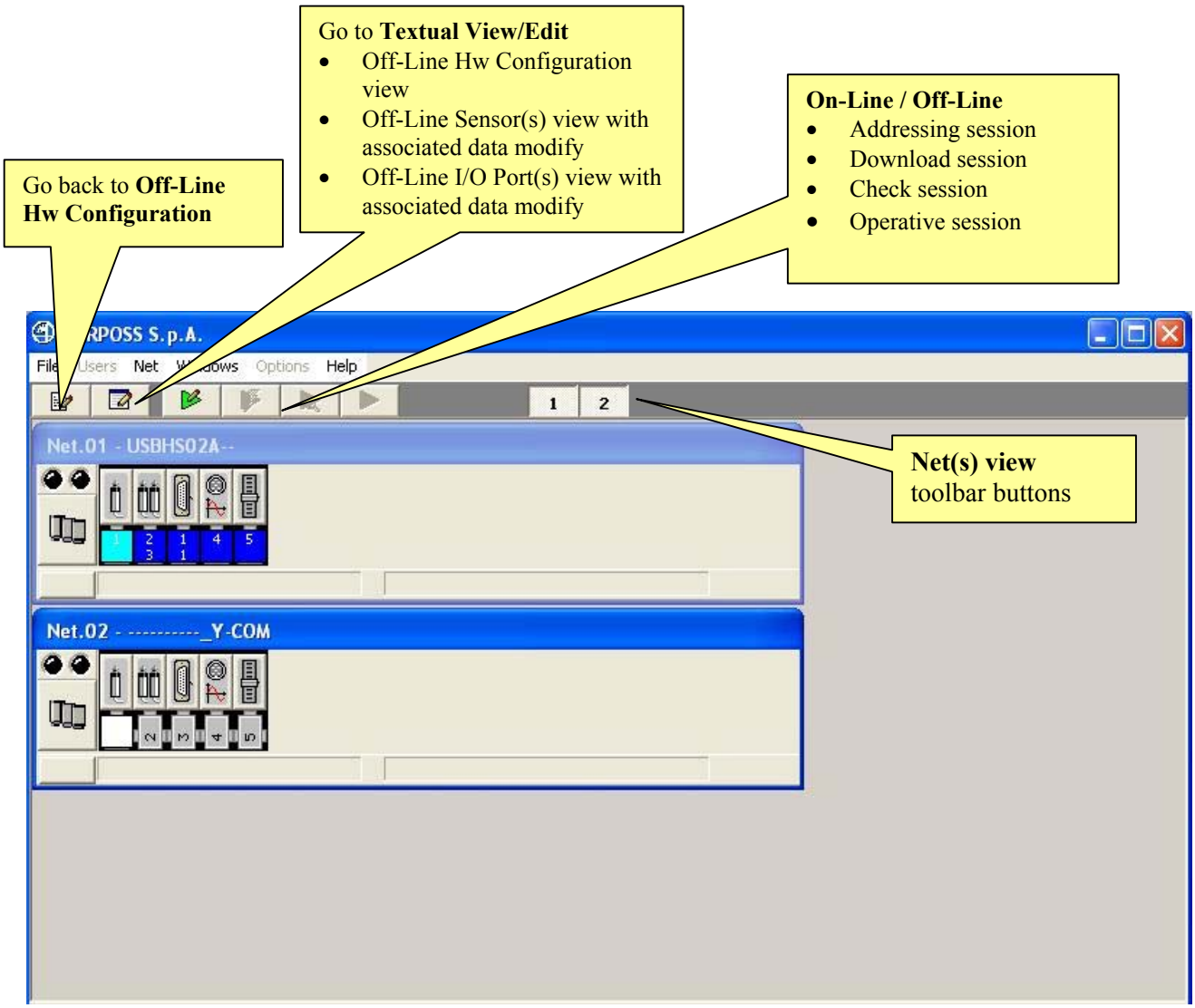


Figure 7: Main Window in On-Line mode
(example for a Network with 2 Nets, communication stopped)

The maximum number of Nets simultaneously visible is 4: *Net(s) view toolbar buttons* let toggling between viewing on/off selected Net.

On-Line/Off-Line toolbar buttons

This button returns to the **Off-Line** mode.

This button let to see the **Hardware Configuration**, to modify some Sensor and/or I/O Port parameters and check hardware configuration in textual chart.(see).

This button starts the **Addressing session**.
Addressing session let user to assign network address to any unit.
Addressing session, while assigning address, also acquires all information about unit involved.(see).

This button starts the **DownLoad session**.
Download session let user to force a just existing configuration to network(s). Existing configuration must be correct and matching with existing hardware.
Global modify on network(s) parameters is carried.

This button starts the **Check session**.
Check session acquires state of network(s) unit(s) and check it against current hardware configuration and parametrization.
No modify on network(s) parameters is carried.

This button starts the **Operative session**.
Operative session let user to check proper on-line capability of network(s) and to have diagnosis information.
Operative session let user to program parameters that specialize unit behaviour.

5.1 Net View

In this figure are represented two examples of Net Form, how them appear in On-Line mode.
Views are different in On-Line mode if communication is started or stopped.
Views are different depending on selected format mode:
- default "Panel with Units buttons" + "Status Bar"
- maximized "Panel with Units buttons" + "Status Bar" + "Interface Data"
- minimized "Panel with Units buttons"

Views are different depending on Addressing session was just done or not.

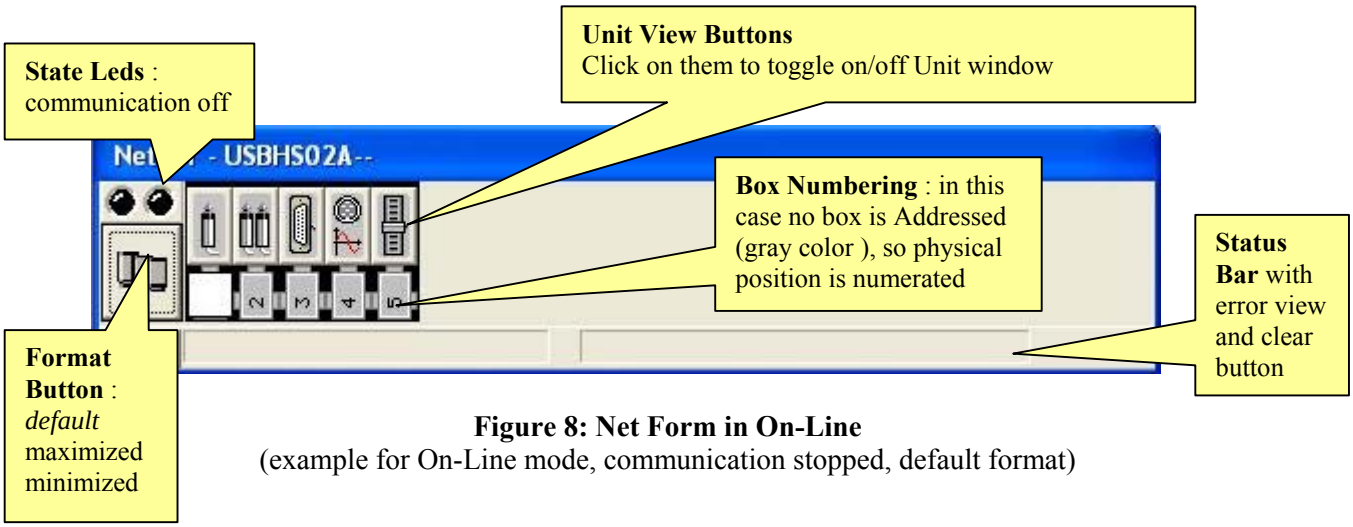


Figure 8: Net Form in On-Line
(example for On-Line mode, communication stopped, default format)

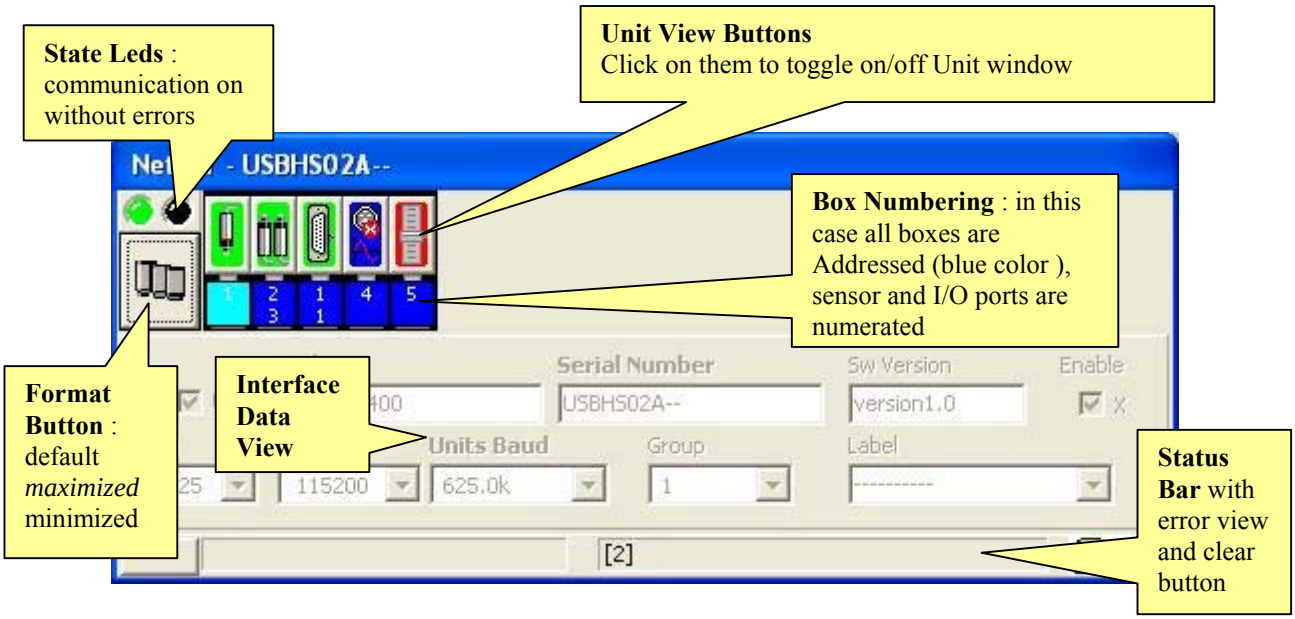


Figure 9: Net Form in On-Line
(example for On-Line mode, communication started, maximized format)

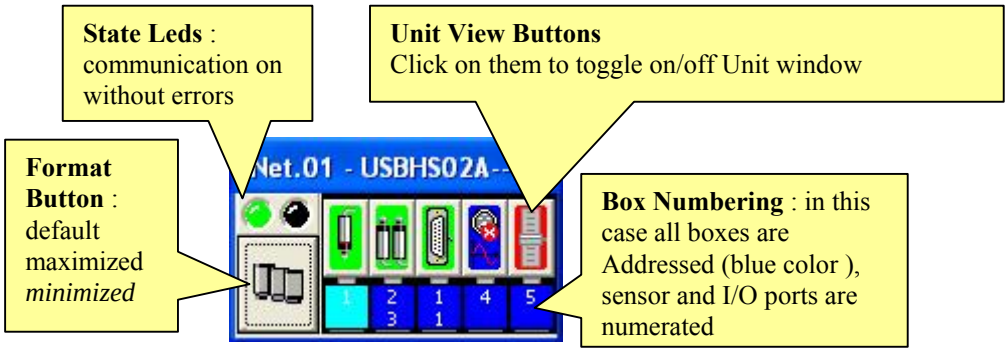


Figure 10: Net Form in On-Line
(example for On-Line mode, communication started, minimized format)

Note : In On-Line mode, communication stopped, **data can not be changed** except toggling **Enable flag**.
In On-Line mode, communication started, **data can not be changed.**

State Led.

Indicates **communication OFF**

Indicates **communication ON** without errors or alarms

Indicates communication on with **ERROR or ALARM** pending

Minimized/Default/Maximized Button.

These buttons toggle between 3 different display formats (maximized, default and minimized).
In the maximized format is possible to see all information, including Interface data.
Default and maximized format foresee a Status Bar.

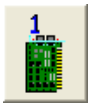
Button image indicates the Net interface type (COM, PCI channel, ISA channel):

Interface (any)

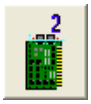
Interface (any) , check warning

Interface (COM/232 or COM/USB)

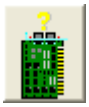
Interface (COM/232 or COM/USB) , check warning



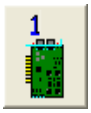
ISA Card , channel 1



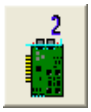
ISA Card , channel 2



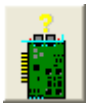
ISA Card , check warning



PCI Card , channel 1



PCI Card , channel 2



PCI Card , check warning

Unit view Button .

Button image indicates the Unit type and explains some programming data, communication state, check results if available.
Button toggles Unit Form showing it or closing it.

Unit view Button : LVDT 1 Channel


LVDT Off-Line, disabled


LVDT Off-Line, enabled , no check done


LVDT Off-Line, enabled , check failed: fatal error on unit


LVDT Off-Line, enabled , check error: hardware mismatch


LVDT Off-Line, enabled , check warning: parameter mismatch


LVDT Off-Line, enabled , check ok


LVDT On-Line, TRANSITORY state, sensor forward


LVDT On-Line, TRANSITORY state, sensor backward


LVDT On-Line, OK state, transducer without retentive data, sensor forward


LVDT On-Line, OK state, transducer without retentive data, sensor backward


LVDT On-Line, OK state, transducer with retentive data, sensor forward


LVDT On-Line, OK state, transducer with retentive data, sensor backward


LVDT On-Line, OVER-RANGE state, transducer without retentive data, sensor forward


LVDT On-Line, OVER-RANGE state, transducer without retentive data, sensor backward


LVDT On-Line, OVER-RANGE state, transducer with retentive data, sensor forward


LVDT On-Line, OVER-RANGE state, transducer with retentive data, sensor backward


LVDT On-Line, WARNING state, transducer disconnected, sensor forward


LVDT On-Line, WARNING state, transducer disconnected, sensor backward


LVDT On-Line, ALARM state


LVDT On-Line, ALARM state

LVDT On-Line, ADDRESSING state

LVDT On-Line, ADDRESSING state

LVDT On-Line, ADDRESSING state

Unit view Button : LVDT 2 Channels


LVDT-2 Off-Line, disabled


LVDT-2 Off-Line, enabled , no check done


LVDT-2 Off-Line, enabled , check failed: fatal error on unit


LVDT-2 Off-Line, enabled , check error: hardware mismatch


LVDT-2 Off-Line, enabled , check warning: parameter mismatch


LVDT-2 Off-Line, enabled , check ok


LVDT-2 On-Line, TRANSITORY state channel 1


LVDT-2 On-Line, TRANSITORY state channel 2


LVDT-2 On-Line, OK state channel 1


LVDT-2 On-Line, OK state channel 2


LVDT-2 On-Line, OVER-RANGE. state channel 1


LVDT-2 On-Line, OVER-RANGE. state channel 2


LVDT-2 On-Line, WARNING state, transducer disconnected channel 1


LVDT-2 On-Line, WARNING state, transducer disconnected channel 2


LVDT-2 On-Line, ALARM state


LVDT-2 On-Line, ALARM state


LVDT-2 On-Line, ADDRESSING state


LVDT-2 On-Line, ADDRESSING state


LVDT-2 On-Line, ADDRESSING state

Unit view Button : I/O

	I/O Off-Line, disabled
	I/O Off-Line, enabled , not checked
	I/O Off-Line, enabled , check failed: fatal error on unit
	I/O Off-Line, enabled , check error: hardware mismatch
	I/O Off-Line, enabled , check warning: parameter mismatch
	I/O Off-Line, enabled , check ok
	I/O On-Line, TRANSITORY state
	I/O On-Line, OK state
	I/O On-Line, ALARM state
	I/O On-Line, ALARM state
	I/O On-Line, ADDRESSING state
	I/O On-Line, ADDRESSING state
	I/O On-Line, ADDRESSING state

Unit view Button : Analogic Input


Analogic Input Off-Line, disabled


Analogic Input Off-Line, enabled , not checked


Analogic Input Off-Line, enabled , check failed: fatal error on unit


Analogic Input Off-Line, enabled , check error: hardware mismatch


Analogic Input Off-Line, enabled , check warning: parameter mismatch


Analogic Input Off-Line, enabled , check ok


Analogic Input On-Line, TRANSITORY state


Analogic Input On-Line, OK state


Analogic Input On-Line, OVER RANGE state


Analogic Input On-Line, ALARM state


Analogic Input On-Line, ALARM state


Analogic Input On-Line, ADDRESSING state


Analogic Input On-Line, ADDRESSING state


Analogic Input On-Line, ADDRESSING state

Unit view Button : Encoder

Encoder Off-Line, disabled

Encoder Off-Line, enabled , not checked

Encoder Off-Line, enabled , check failed: fatal error on unit

Encoder Off-Line, enabled , check error: hardware mismatch

Encoder Off-Line, enabled , check warning: parameter mismatch

Encoder Off-Line, enabled , check ok

Encoder On-Line, TRANSITORY state

Encoder On-Line, OK state

Encoder On-Line, OVER RANGE state

Encoder On-Line, WARNING state, transducer disconnected

Encoder On-Line, NOT CALIBRATED state

Encoder On-Line, ALARM state

Encoder On-Line, ALARM state

Encoder On-Line, ADDRESSING state

Encoder On-Line, ADDRESSING state

Encoder On-Line, ADDRESSING state

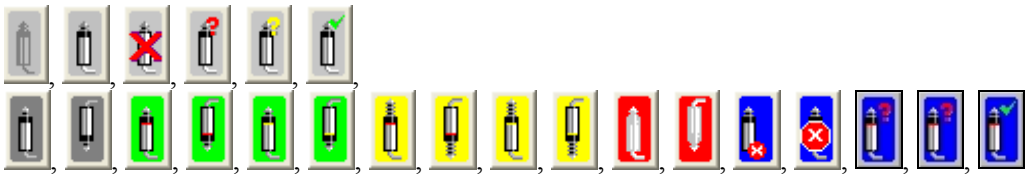
Status Bar with **Error Clear Button.**

, , … rror specification string is showed on Status Bar.

5.2 Unit View

Unit(s) view can be expanded or collapsed via clicking on Unit View Buttons.

5.2.1 LVDT Unit View



Off-Line

On-Line

This Button on Net Form indicates a LVDT Station Unit.
Click on Button to toggle on/off the data view.

In this figure are represented two examples of LVDT Unit Form, how them appear in On-Line mode.
Views are different in On-Line mode if communication is started or stopped.
Views are different depending on selected format mode:
- default "Panel with Measure View" + "Status Bar"
- maximized "Panel with Measure View " + "Status Bar" + "Unit Data"
- minimized "Panel with Measure View "

Views are different depending on Addressing session was just done or not.

Figure 11: Unit LVDT Form in On-Line mode
(example for On-Line mode,
communication stopped, default format)

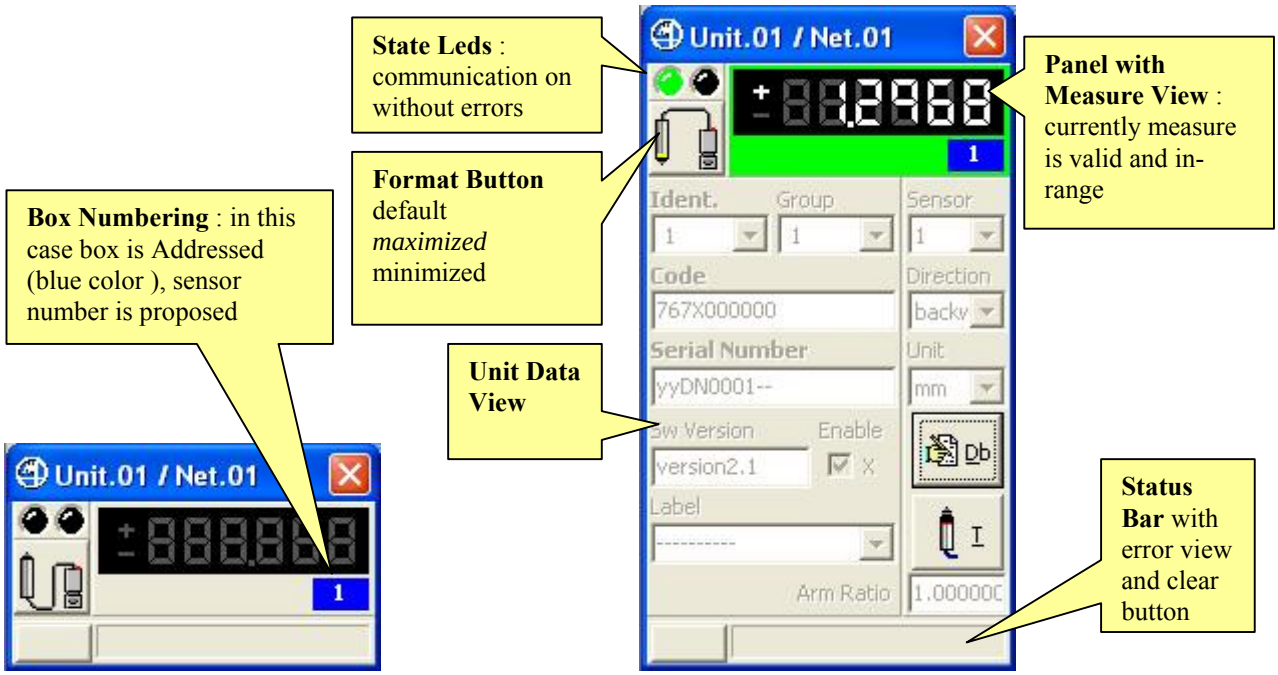


Figure 12: Unit LVDT Form in On-Line mode
(example for On-Line mode,
communication started, maximized format)

Note : In On-Line mode, communication stopped, **data can not be changed** except toggling **Enable flag**.
In On-Line mode, communication started, **data can not be changed.**

State Led.

Indicates **communication OFF**

Indicates **communication ON** without errors or alarms

Indicates communication on with **ERROR or ALARM** pending

Format Button.

This button toggles between 3 different formats (maximized, default and minimized).
In the maximized format is possible to see all information, including Unit data.
Default and maximized format foresee a Status Bar.

Button image indicates the Unit type and some programming informations:

LVDT

LVDT, transducer without retentive data sensor forward

LVDT, transducer without retentive data sensor backward

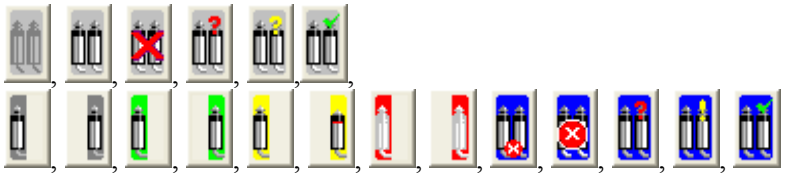
LVDT, transducer with retentive data sensor forward

LVDT, transducer with retentive data sensor backward

Status Bar with **Error Clear Button.**

, … rror specification string is showed on Status Bar.

5.2.2 LVDT-2 Unit View



Off-Line

On-Line

This Button on Net Form indicates a LVDT-2 Station Unit.
Click on Button to toggle on/off the data view.

In this figure are represented two examples of LVDT-2 Unit Form, how them appear in On-Line mode.
Views are different in On-Line mode if communication is started or stopped.
Views are different depending on selected format mode:
- default "Panel with Measure View" + "Status Bar"
- maximized "Panel with Measure View " + "Status Bar" + "Unit Data"
- minimized "Panel with Measure View "

Views are different depending on Addressing session was just done or not.

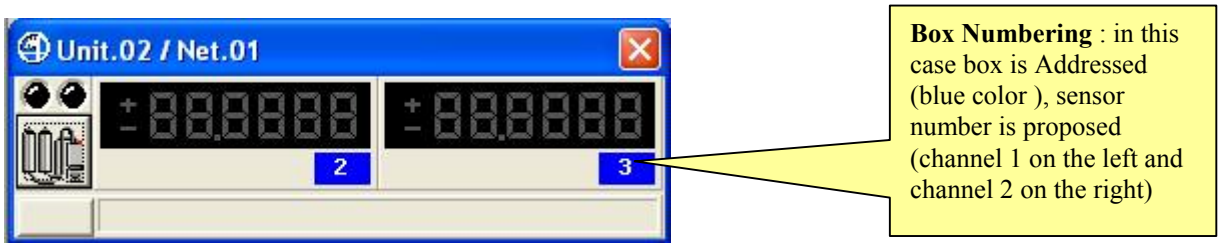


Figure 13: Unit LVDT-2 Form in On-Line mode
(example for On-Line mode, communication stopped, default format)

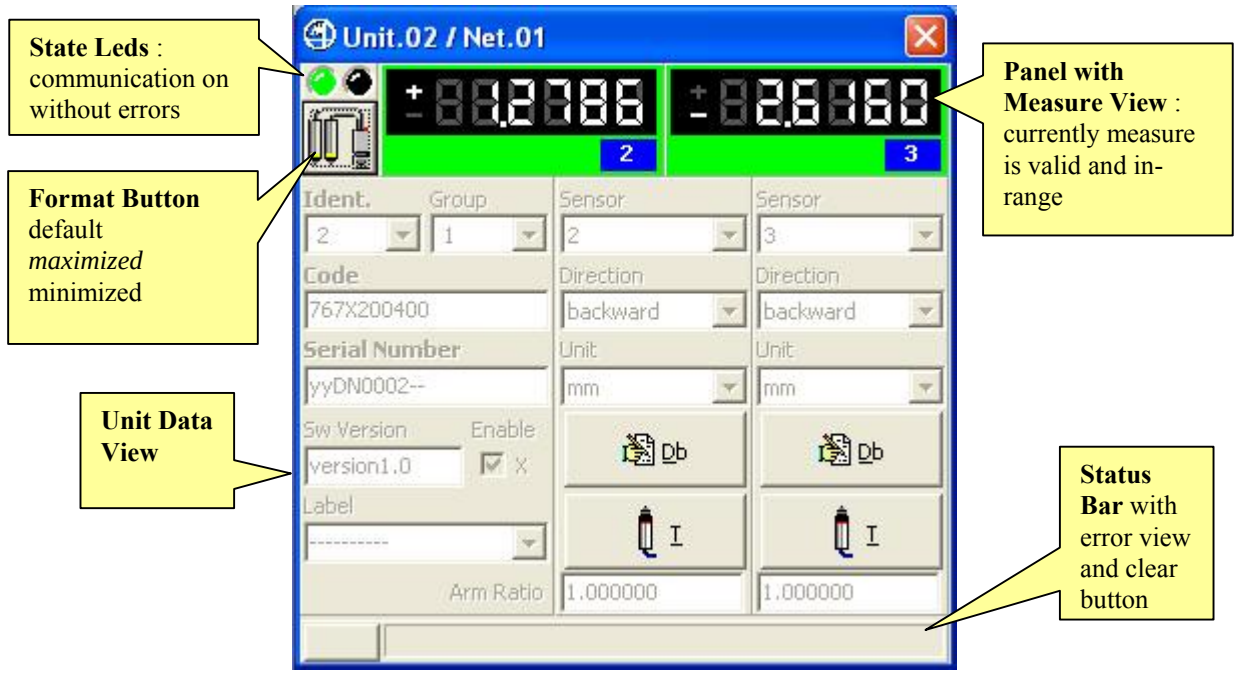


Figure 14: Unit LVDT-2 Form in On-Line mode
(example for On-Line mode, communication started, maximized format)

Note : In On-Line mode, communication stopped, **data can not be changed** except toggling **Enable flag**.
In On-Line mode, communication started, **data can not be changed.**

State Led.

Indicates **communication OFF**

Indicates **communication ON** without errors or alarms

Indicates communication on with **ERROR or ALARM** pending

Format Button.

This button toggles between 3 different formats (maximized, default and minimized).
In the maximized format is possible to see all information, including Unit data.
Default and maximized format foresee a Status Bar.

Button image indicates the Unit type and some programming informations:

LVDT-2

LVDT-2, channel 1, transducer without retentive data sensor forward

LVDT-2, channel 1, transducer without retentive data sensor backward

LVDT-2, channel 2, transducer without retentive data sensor forward

LVDT-2, channel 2, transducer without retentive data sensor backward

LVDT-2, channel 1, transducer with retentive data sensor forward

LVDT-2, channel 1, transducer with retentive data sensor backward

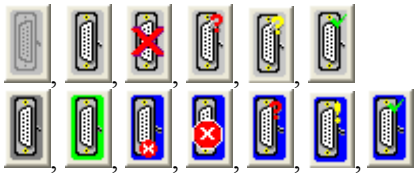
LVDT-2, channel 2, transducer with retentive data sensor forward

LVDT-2, channel 2, transducer with retentive data sensor backward

Status Bar with **Error Clear Button.**


, … rror specification string is showed on Status Bar.

5.2.3 I/O Unit View



Off-Line

On-Line

This Button in Net Form indicates an I/O Station Unit.
Click on Button to toggle on/off the data view.

In this figure are represented two examples of I/O Unit Form, how them appear in On-Line mode.
Views are different in On-Line mode if communication is started or stopped.
Views are different depending on selected format mode:
- default "Panel with In Leds & Out Switches" + "Status Bar"
- maximized "Panel with In Leds & Out Switches" + "Status Bar" + "Unit Data"
- minimized "Panel with In Leds & Out Switches"

Views are different depending on Addressing session was just done or not.
Views are different depending on I/O Box programming.

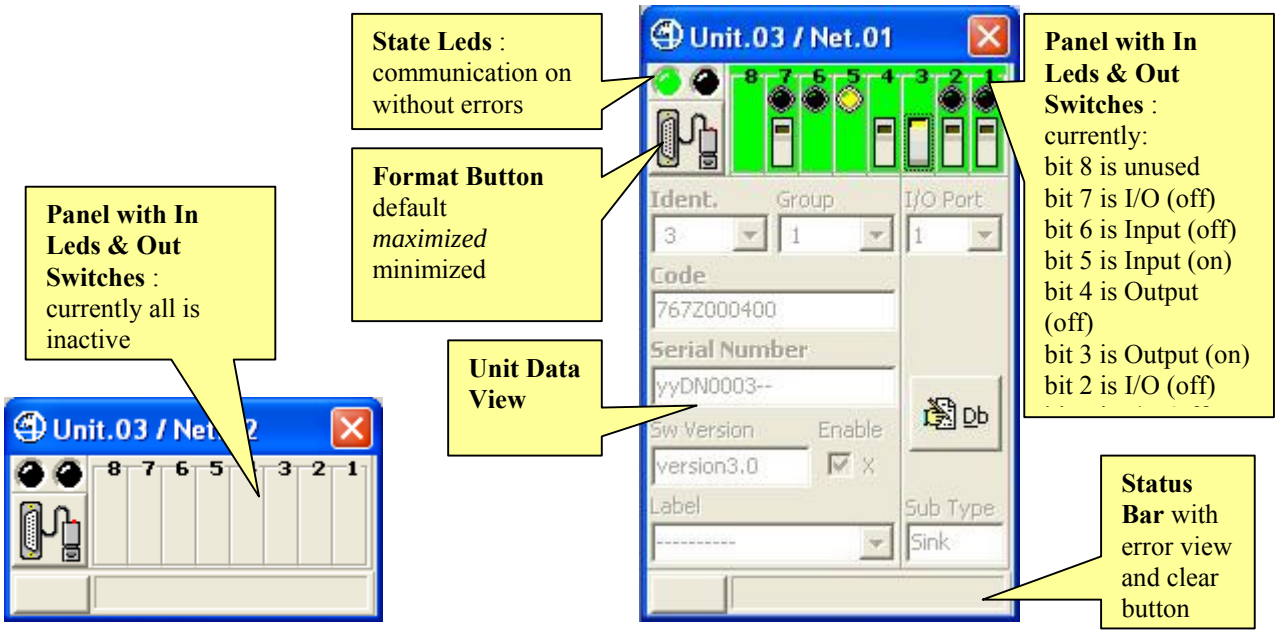


Figure 15: I/O Unit Form in On-Line mode (example for On-Line mode, communication stopped, default format)

Figure 16: I/O Unit Form in On-Line mode (example for On-Line mode, communication started, maximized format)

Note : In On-Line mode, communication stopped, **data can not be changed** except toggling **Enable flag**.
In On-Line mode, communication started, **data can not be changed.**

State Led.

Indicates **communication OFF**

Indicates **communication ON** without errors or alarms

Indicates communication on with **ERROR or ALARM** pending

Format Button.

This button toggles between 3 different formats (maximized, default and minimized).
In the maximized format is possible to see all information, including Unit data.
Default and maximized format foresee a Status Bar.

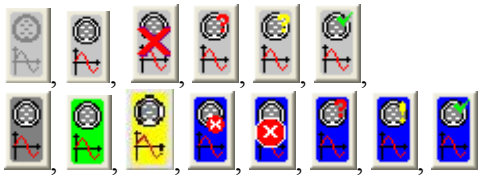
Button image indicates the Unit type:

I/O

Status Bar with **Error Clear Button.**


, … rror specification string is showed on Status Bar.

5.2.4 Analogic Input Unit View



Off-Line

On-Line

This Button in Net Form indicates an Analogic Input Station Unit.
Click on Button to toggle on/off the data view.

In this figure are represented two examples of Analogic Input Unit Form, how them appear in On-Line mode.
Views are different in On-Line mode if communication is started or stopped.
Views are different depending on selected format mode:
- default "Panel with Measure View" + "Status Bar"
- maximized "Panel with Measure View " + "Status Bar" + "Unit Data"
- minimized "Panel with Measure View "

Views are different depending on Addressing session was just done or not.

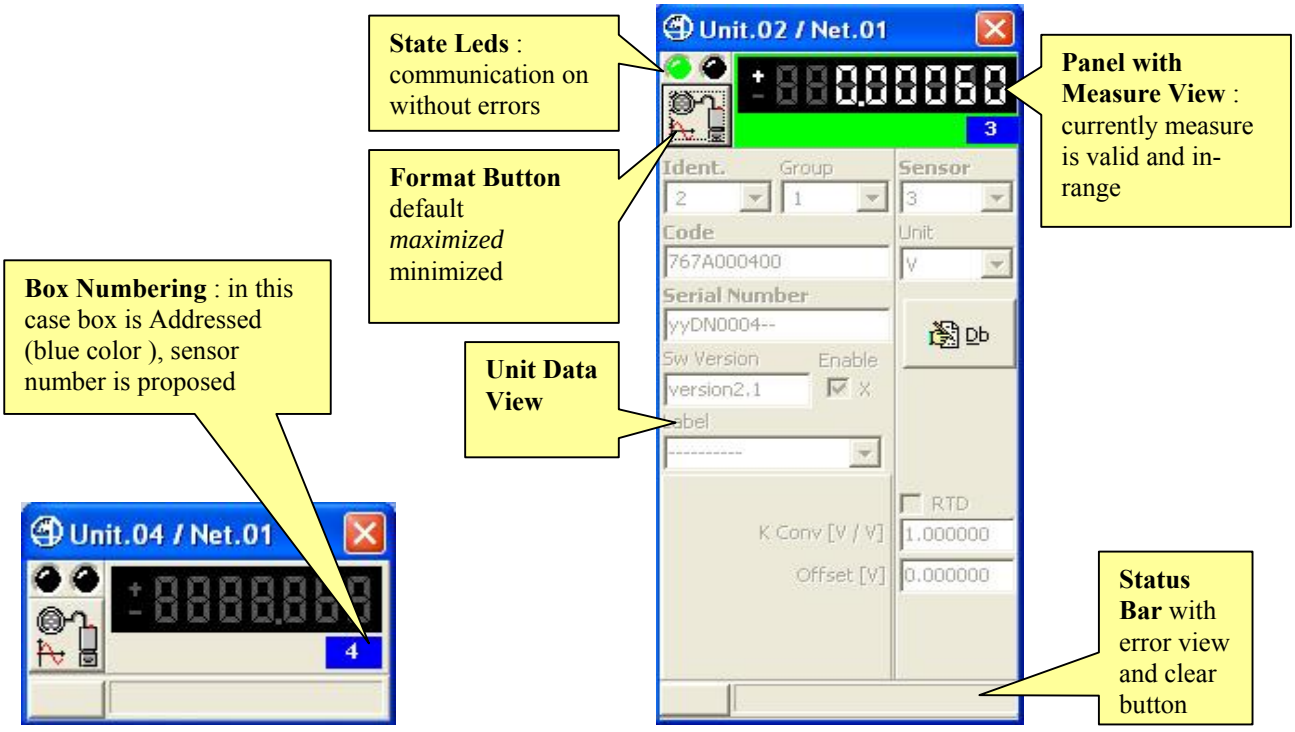


Figure 17: Analogic Input Form in On-Line mode (example for On-Line mode, communication stopped, default format)

Figure 18: Analogic Input Form in On-Line mode (example for On-Line mode, communication started, maximized format)

Note : In On-Line mode, communication stopped, **data can not be changed** except toggling **Enable flag**.
In On-Line mode, communication started, **data can not be changed.**

State Led.

Indicates **communication OFF**

Indicates **communication ON** without errors or alarms

Indicates communication on with **ERROR or ALARM** pending

Format Button.

This button toggles between 3 different formats (maximized, default and minimized).
In the maximized format is possible to see all information, including Unit data.
Default and maximized format foresee a Status Bar.

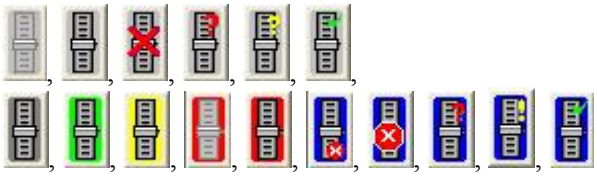
Button image indicates the Unit type:

Analogic Input

Status Bar with **Error Clear Button.**

 ,  , … rror specification string is showed on Status Bar.

5.2.5 Incremental Digital or Analog Encoder Unit View



This Button in Net Form indicates an Incremental Digital or Analog Encoder Station Unit.
Click on Button to toggle on/off the data view.

In this figure are represented two examples of Incremental Digital or Analog Encoder Unit Form, how them appear in On-Line mode.
Views are different in On-Line mode if communication is started or stopped.
Views are different depending on selected format mode:
- default "Panel with Measure View" + "Status Bar"
- maximized "Panel with Measure View " + "Status Bar" + "Unit Data"
- minimized "Panel with Measure View "

Views are different depending on Addressing session was just done or not.

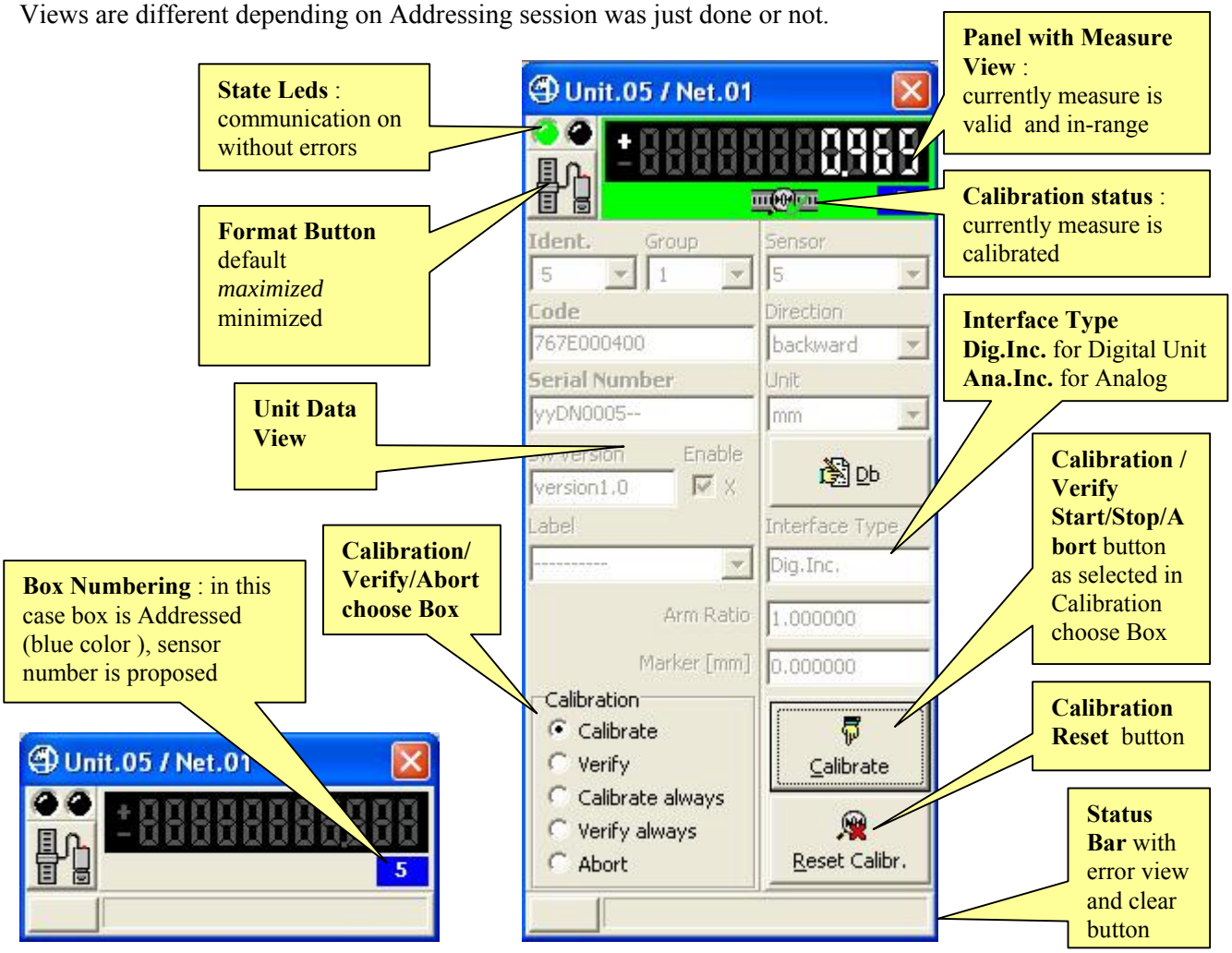


Figure 19: Encoder Form in On-Line mode (example for On-Line mode, communication stopped, default format)

Figure 20: Encoder Form in On-Line mode (example for On-Line mode, communication started, maximized format)

Note : In On-Line mode, communication stopped, **data can not be changed** except toggling **Enable flag**.
In On-Line mode, communication started, **data can not be changed.**

State Led.

Indicates **communication OFF**

Indicates **communication ON** without errors or alarms

Indicates communication on with **ERROR or ALARM** pending

Format Button.

This button toggles between 3 different formats (maximized, default and minimized).
In the maximized format is possible to see all information, including Unit data.
Default and maximized format foresee a Status Bar.

Button image indicates the Unit type:

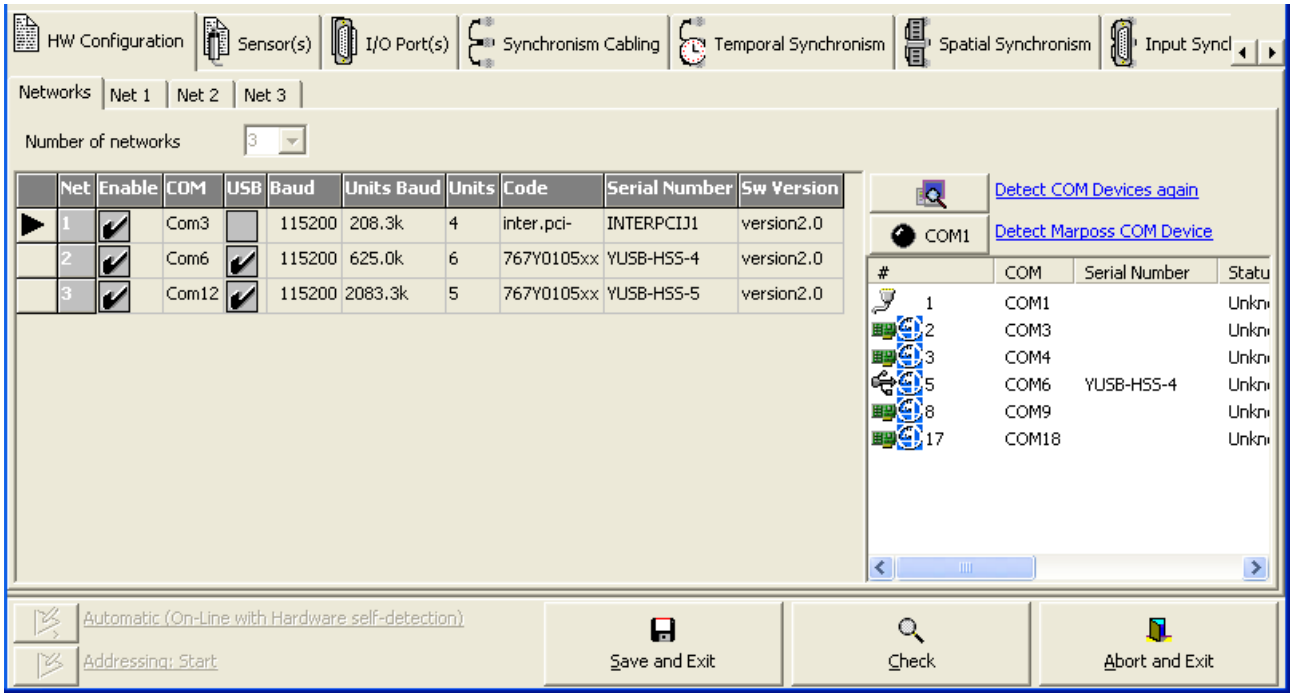
Incremental Digital or Analog Encoder

Status Bar with **Error Clear Button.**

 ,  , … rror specification string is showed on Status Bar.

5.3 Edit Configuration

Configuration Edit let user to have a textual chart of current configuration, print and to check it globally. **Changes to HW configuration are not admitted**. For an explanation of pages and commands see chapter **6**.



5.4 Addressing Session

ToolButtons : Addressing On-Line Session.
Starts Communication Session.

Addressing On-Line Session lets to:

- Assign a Sensor Number to each Station Unit associated to a measure point
- Assign an Input Number to each Station Unit associated to a input port
- Assign an Output Number to each Station Unit associated to an output port
- Assign a Logical Identification Number (short) to each active Station Unit: Logic Identification Number is Unit Address in Net, necessary to communicate with Unit
- Assign optionally programmed Group and Label to Interface and to Addressed Station Units
- Self-Acquire Code, Serial Number, Software Version of Interface and Addressed Station Units

5.4.1 Start

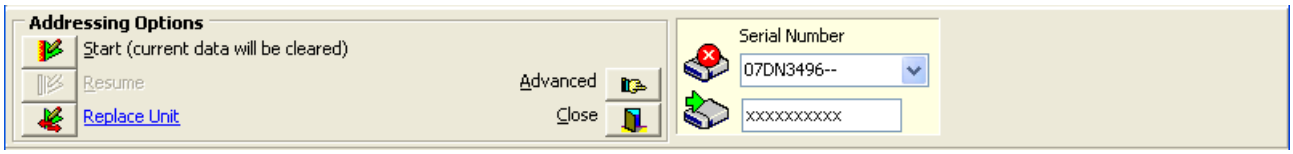
Clear current addressing data and start new addressing session.

5.4.2 Resume

Continue an addressing session.

5.4.3 Replace Unit

Allows to replace unit

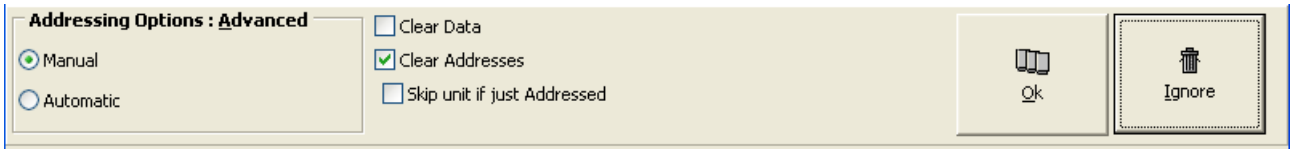


In order to perform a replacement of a Unit:

1. Remove unit from line
2. Insert new unit
3. Input serial number of removed unit into the upper field
4. Input serial number of inserted unit into the lower field
5. Press “Replace Unit” button

5.4.4 Advanced Addressing

5.4.4.1 Addressing Mode with Selection: Manual



User can define **Sensor Number** for each station involving measure.
One addressing method is supported:

- selection of destination unit is requested after transducer move

User can define **Input and/or Output Number** for each station involving I/O port.
Two addressing methods are supported for unit with Input capability:

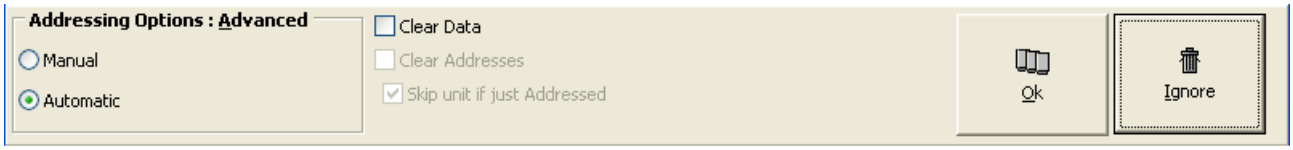
- selection of destination unit and proper SerialNumber editing is requested
- selection of destination unit is requested after Input port change

One addressing method is supported for unit with Output capability only:

- selection of destination unit and proper SerialNumber editing is requested

Options	
Clear Data	**Clear all** acquired data (serial number, code, software version)
Clear Addresses	**Clear all** Channel Id
Skip Unit if just Addressed	Skip programming if Unit was just Addressed, in order to avoid erroneous assignments

5.4.4.2 Addressing Mode with Selection: Automatic



Sensor Number is automatically defined with incremental numbering.

- selection of destination unit is automatic after transducer move

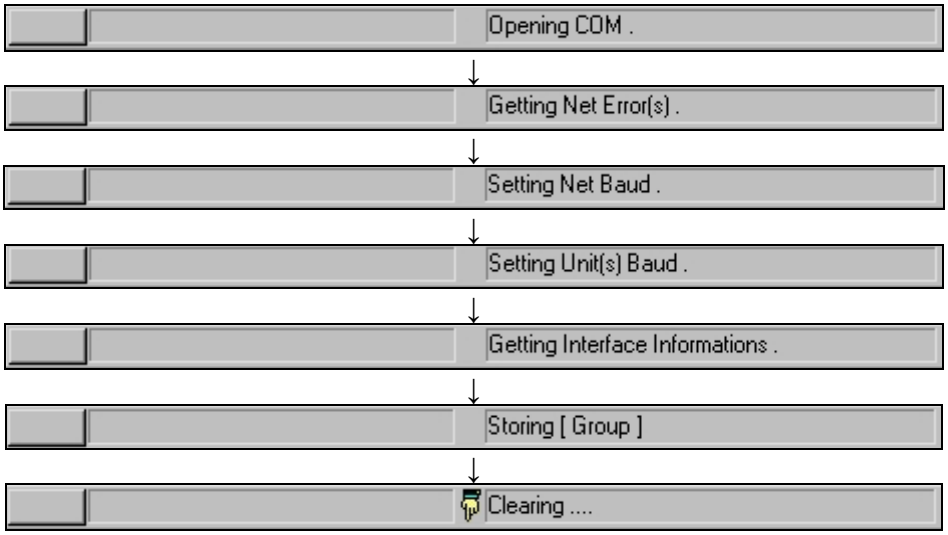
Input/Output Number is automatically defined with incremental numbering.

- selection of destination unit is automatic after Input port change

Unit with Output capability only can not be addressed in automatic mode.

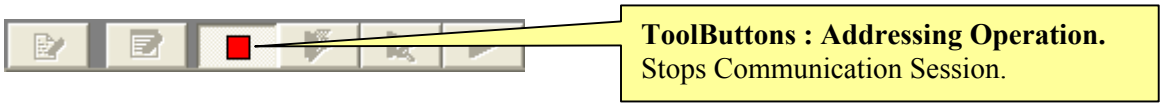
5.4.5 Start Addressing Operation

After Addressing mode is selected Driver tries to establish communication.
During the establishment Status Bar of all enabled Nets points out the current operation progress and Minimized/Default/Maximized Button is not operative.



The establishment operations takes some time; if the communication is not established, a message box appears reporting error specification.

5.4.6 Termination of Addressing operation



Addressing session can be stopped by User at any time .

Note : In Automatic Mode, Addressing Operation terminates automatically when all units are addressed.

5.4.7 Manual Addressing

After the establishment of communication Status Bar points out the request of Unit Addressing.

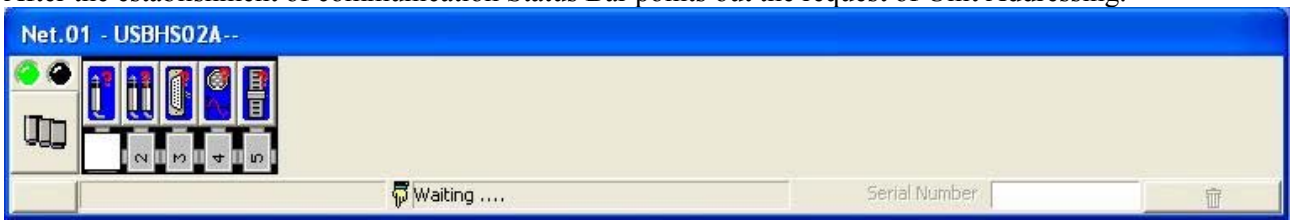


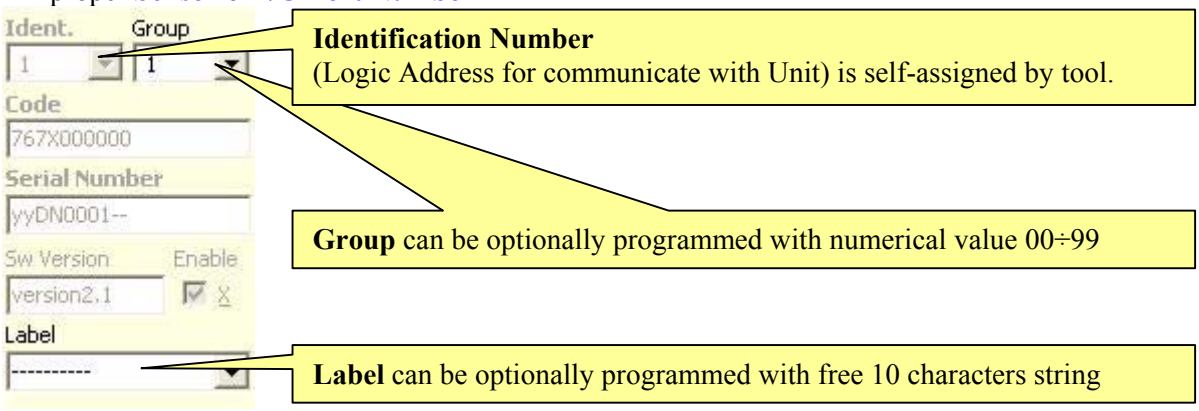
Figure 21: Net Form in On-Line mode
(example for On-Line Manual Addressing mode, waiting a change in a Unit state)

In **Manual Addressing mode with Unit input change** :

- LVDT transducer motion
- I/O input bit level change
- Analogic Input input signal change
- Encoder encoder movement

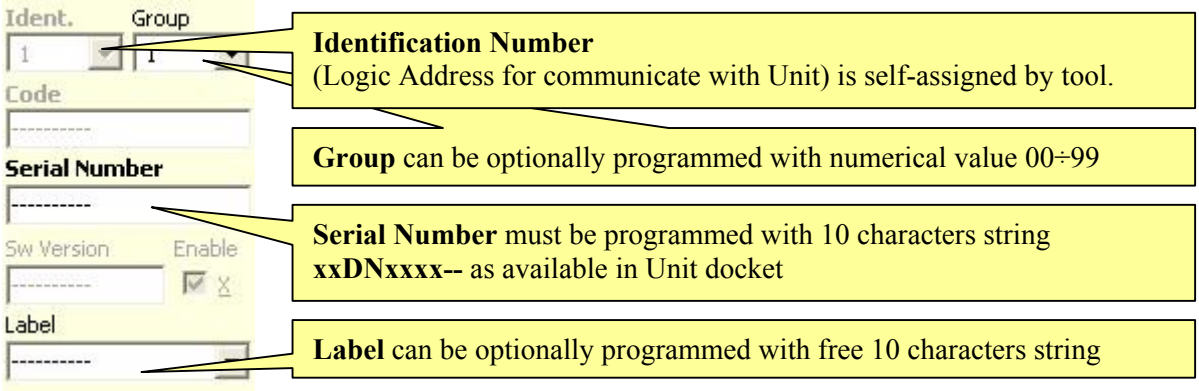
is necessary to select the required Unit under identification without the need of other programming.
Tool will propose automatically :

- proper **Identification Number**
- proper **Sensor** or **I/O Port Number**



In **Manual Addressing mode with Serial Number entering :**
is necessary to select the required Unit under identification and program the unique Serial Number.
Tool will propose automatically :

- proper **Identification Number**
- proper **Sensor** or **I/O Port Number**



Both in **Manual Addressing mode with Unit input change** and **Manual Addressing mode with Serial Number entering** , tool will self-propose :

Sensor Number:

- LVDT 1-Channel 1 sensor
- LVDT 2-Channels 2 sensors
- Analogic Input 1 sensor
- Encoder 1 sensor

*First available **Sensor** is proposed: it can be changed, if desired, choosing between available ones.*
***Sensor** can be also cleared, with "---"choose.*

I/O Port Number:

- I/O 1 Input port , 1 Output port

*First available **I/O Port** is proposed: it can be changed, if desired, choosing between available ones.*
***I/O Port** can be also cleared, with "---" choose.*

LVDT Unit Addressing , transducer motion required.

A transducer motion is required: only a transducer has to pressed or released at a time.
After it, Status Bar points out information about Unit involved in transducer movement, and user is asked to select the desired location for Unit.
"Minimized/Default/Maximized Button" of Net involved in selection changes temporarily image appearance showing a question mark.

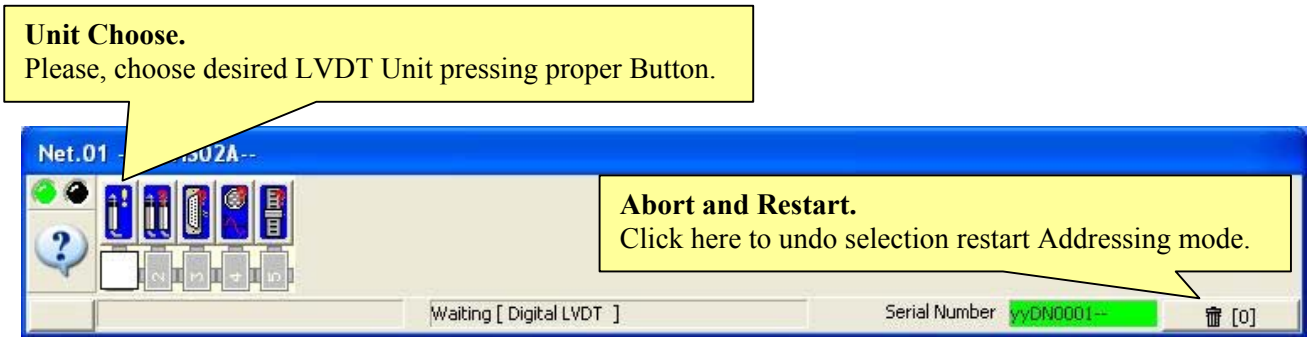


Figure 22: Net Form in On-Line
(example for On-Line Manual Addressing mode, waiting a LVDT Unit selection)

Net Form Buttons suggest addressing state of each LVDT Unit.
However any Location associated to a LVDT Unit can be selected.

Helping with Button Image.	
	No suggest
	Applicant Location
	Just assigned Location

A **Button in Net Form has to be selected**: click on chosen Location.

Note : manually inserting of the production serial number is necessary if thermal probe is connected.

After selection of Location, a programming window appears.

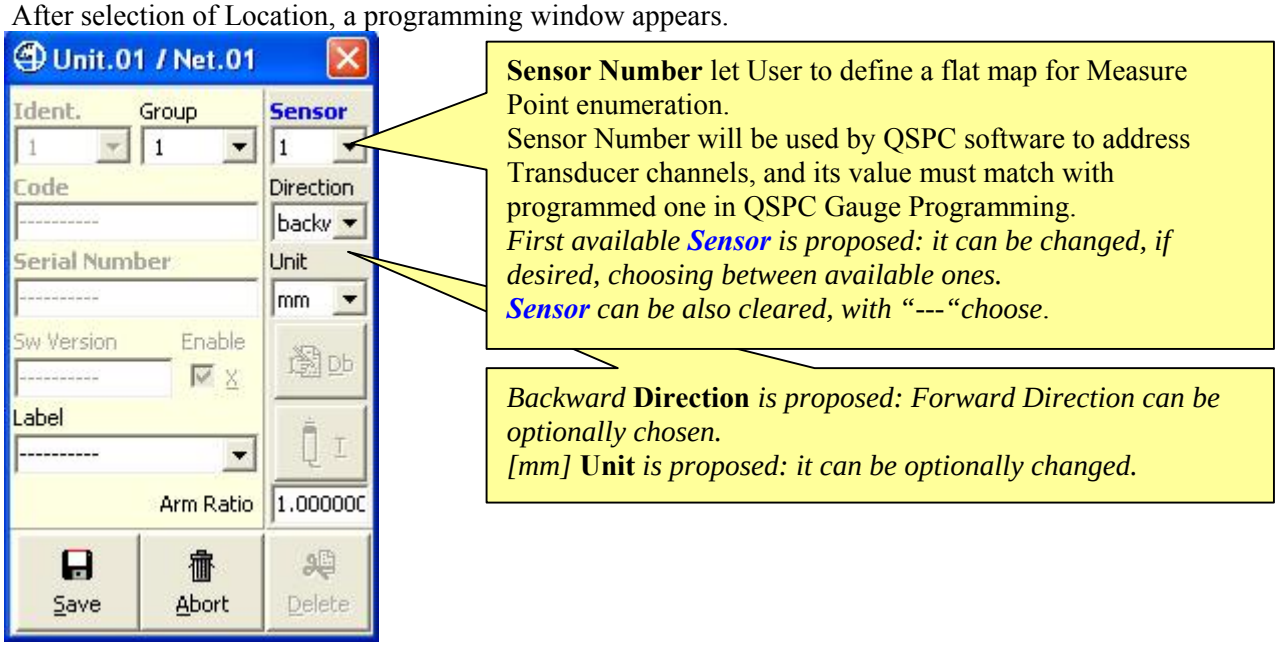


Figure 23: LVDT Unit Addressing Form
(1st selection)

Typically, only Save button has to be clicked.

Relevant Data.	
Sensor Number	Select Sensor Number from a list of available numbers only , Select "---" item to clear current number.
Direction	Backward/Forward.
Unit	Millimetres, Degrees, Celsius Degrees, Grams can be chosen .
Arm Ratio	Values between 0.5 and 4.0 can be chosen.
Group	Free for User.
Label	Free for User.

Save , Abort Buttons.	
Save	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
Abort	This button closes window without any saving and restarts addressing operations.

- **LVDT-2 Unit Addressing , transducer motion required.**

A transducer motion is required: only a transducer has to pressed or released at a time.
After it, Status Bar points out information about Unit involved in transducer movement, and user is asked to select the desired location for Unit.
"Minimized/Default/Maximized Button" of Net involved in selection changes temporarily image appearance showing a question mark.

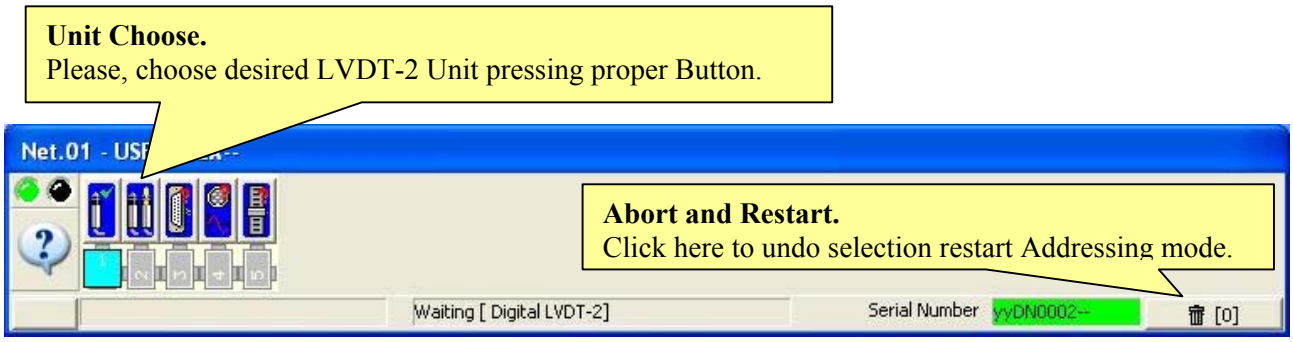


Figure 24: Net Form in On-Line
(example for On-Line Manual Addressing mode, waiting a LVDT-2 Unit selection)

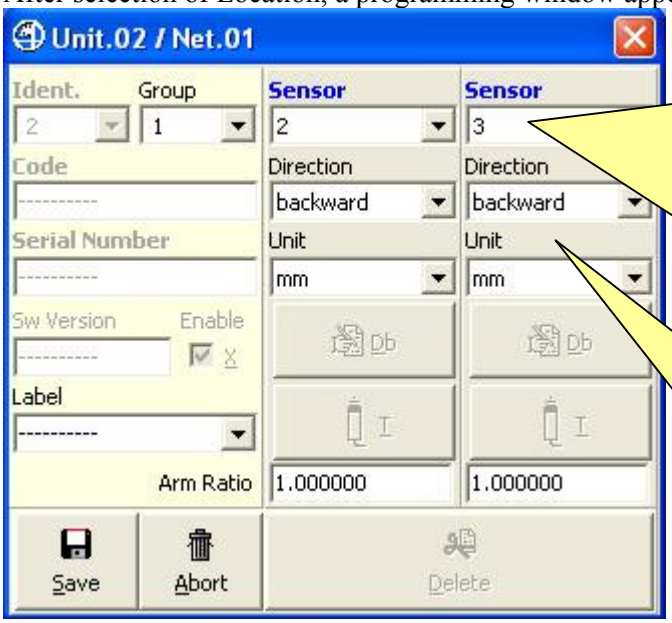
Net Form Buttons suggest addressing state of each LVDT-2 Unit.
However any Location associated to a LVDT-2 Unit can be selected.

Helping with Button Image.	
	No suggest
	Applicant Location
	Just assigned Location

A **Button in Net Form has to be selected**: click on chosen Location.

Note : manually inserting of the production serial number is necessary if thermal probe is connected.

After selection of Location, a programming window appears.



Sensor Number let User to define a flat map for Measure Point enumeration.
Sensor Number will be used by QSPC software to address Transducer channels, and its value must match with programmed one in QSPC Gauge Programming.
The column on the left is referred to channel 1 and the column on the right is referred to channel 2.
*First available **Sensor** is proposed for channel 1 and the second available is proposed for channel 2: they can be changed, if desired, choosing between available ones.*
***Sensor** can be also cleared, with "---" choose.*

Backward **Direction** *is proposed: Forward Direction can be optionally chosen.*
[mm] **Unit** *is proposed: it can be optionally changed.*

Figure 25: LVDT-2 Unit Addressing Form
(1st selection)

Typically, only Save button has to be clicked.

Relevant Data.	
Sensor Number	Select Sensor Number from a list of available numbers only , Select "---" item to clear current number.
Direction	Backward/Forward.
Unit	Millimetres, Degrees, Celsius Degrees, Grams can be chosen .
Arm Ratio	Values between 0.5 and 4.0 can be chosen.
Group	Free for User.
Label	Free for User.

Save , Abort Buttons.	
Save	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
Abort	This button closes window without any saving and restarts addressing operations.

- **I/O Unit Addressing , input bit level change required.**

A Input bit Level Change is required: only a bit level has to be changed at a time.
After it, Status Bar points out information about Unit involved in bit level change, and user is asked to select the desired location for Unit.
"Minimized/Default/Maximized Button" of Net involved in selection changes temporarily image appearance showing a question mark.

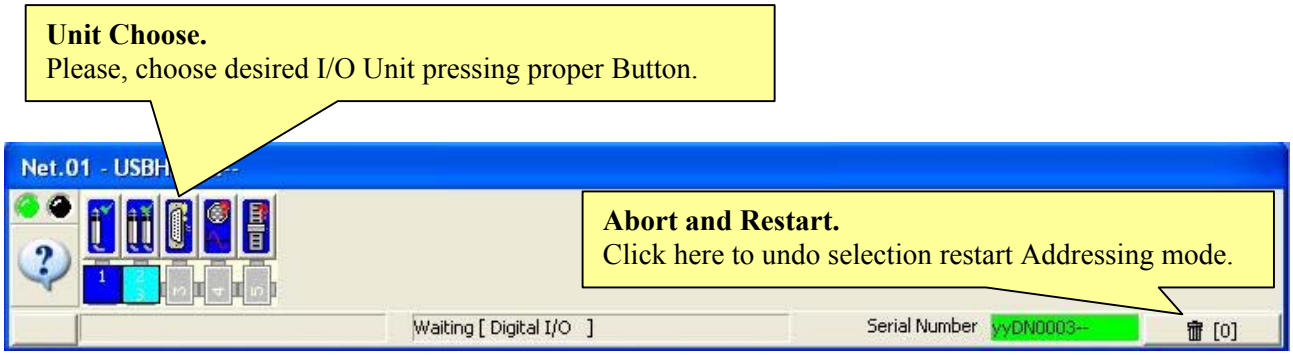


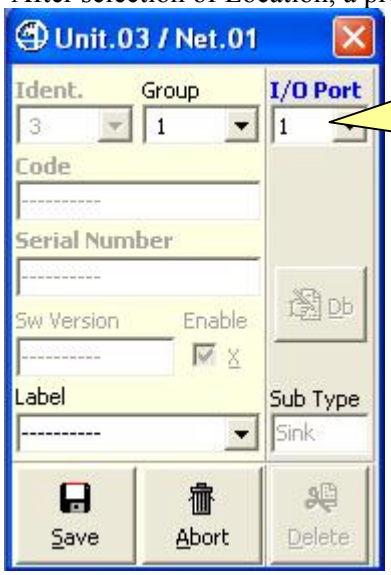
Figure 26: Net Form in On-Line
(example for On-Line Manual Addressing mode, waiting a I/O Unit selection)

Net Form Buttons suggest addressing state of each I/O Unit.
However any Location associated to a I/O Unit can be selected.

Helping with Button Image.	
	No suggest
	Applicant Location
	Just assigned Location

A **Button in Net Form has to be selected**: click on chosen Location.

After selection of Location, a programming window appears.



Input/Output Port Number let User to define a flat map for Input and Output Ports enumeration.
Input and Output Port Number will be used by QSPC software to address Input and Output Port channels, and its value must match with programmed one in QSPC Programming.
*First available **I/O Port** is proposed: it can be changed, if desired, choosing between available ones.*
***I/O Port** can be also cleared, with "---" choose.*

Figure 27: I/O Unit Addressing Form
(1st selection)

Typically, only Save button has to be clicked.

Relevant Data.	
Input/Output Port Number	Select Input/Output Port Number from a list of available numbers only , Select "---" item to clear current number.
Direction	Backward/Forward.
Group	Free for User.
Label	Free for User.

Save , Abort Buttons.	
Save	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
Abort	This button closes window without any saving and restarts addressing operations.

- **Analogic Input Unit Addressing , input value change required.**

The input value variation is required: only an Analogic Input has to be changed at a time.
After it, Status Bar points out information about Unit involved in the Analogic Input variation, and user is asked to select the desired location for Unit.
"Minimized/Default/Maximized Button" of Net involved in selection changes temporarily image appearance showing a question mark.

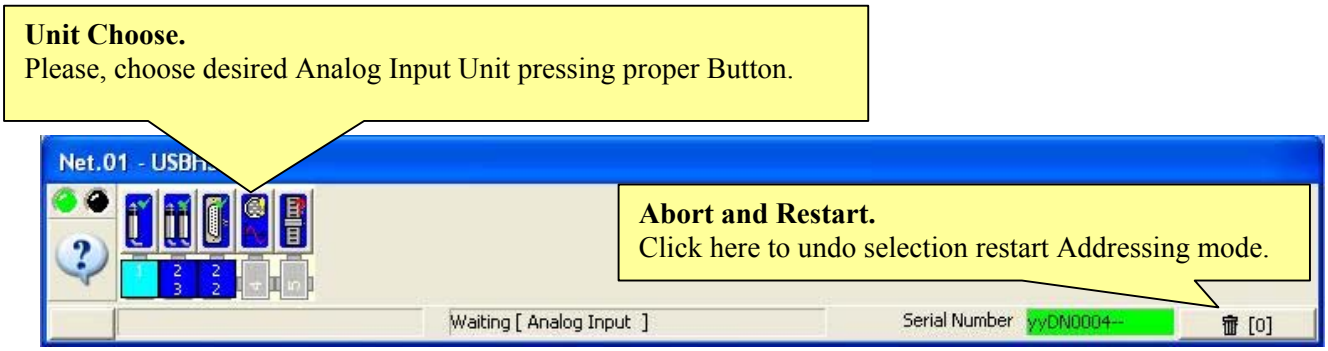


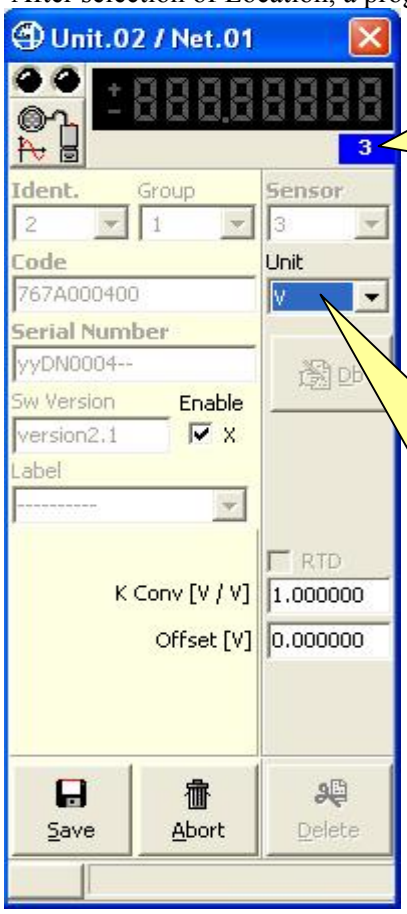
Figure 28: Net Form in On-Line
(example for On-Line Manual Addressing mode, waiting an Analogic Input Unit selection)

Net Form Buttons suggest addressing state of each Analogic Input Unit.
However any Location associated to an Analogic Input Unit can be selected.

Helping with Button Image.	
	No suggest
	Applicant Location
	Just assigned Location

A **Button in Net Form has to be selected**: click on chosen Location.

After selection of Location, a programming window appears.



Sensor Number let User to define a flat map for Measure Point enumeration.
Sensor Number will be used by QSPC software to address Transducer channels, and its value must match with programmed one in QSPC Gauge Programming.
*First available **Sensor** is proposed: it can be changed, if desired, choosing between available ones.*
***Sensor** can be also cleared, with "---" choose.*

[V] **Unit** *is proposed: it can be optionally changed:*

- *---*
- *mm*
- *deg*
- *°C*
- *gr*
- *N*
- *Pa*
- *V*
- *mA*
- *Ohm*
- *N * m*
- *mm / s ^{2}*
- *Rad / s*
- *Rad / s ^{2}*
- *dm ^{3} / s*

Figure 29: Analogic Input Unit Addressing Form
(1st selection)

Typically, only Save button has to be clicked.

Relevant Data.	
Sensor Number	Select Sensor Number from a list of available numbers only , Select "---" item to clear current number.
Unit	Millimeters, Degrees, Celsius Degrees, Grams, Newton, Pascal, Volt, Milliampere, Ohm, N*m, mm/s^2, rad/s, rad/s^2, dm^3/s can be chosen .
K Conv	Input value conversion factor.
Offset	Input value offset.
Group	Free for User.
Label	Free for User.

Save , Abort Buttons.	
Save	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
Abort	This button closes window without any saving and restarts addressing operations.

- **Incremental Digital or Analog Encoder Unit Addressing , encoder motion required.**

The input value variation is required: only an Incremental Digital or Analog Encoder has to be changed at a time.
After it, Status Bar points out information about Unit involved in the Incremental Digital or Analog Encoder variation, and user is asked to select the desired location for Unit.
"Minimized/Default/Maximized Button" of Net involved in selection changes temporarily image appearance showing a question mark.

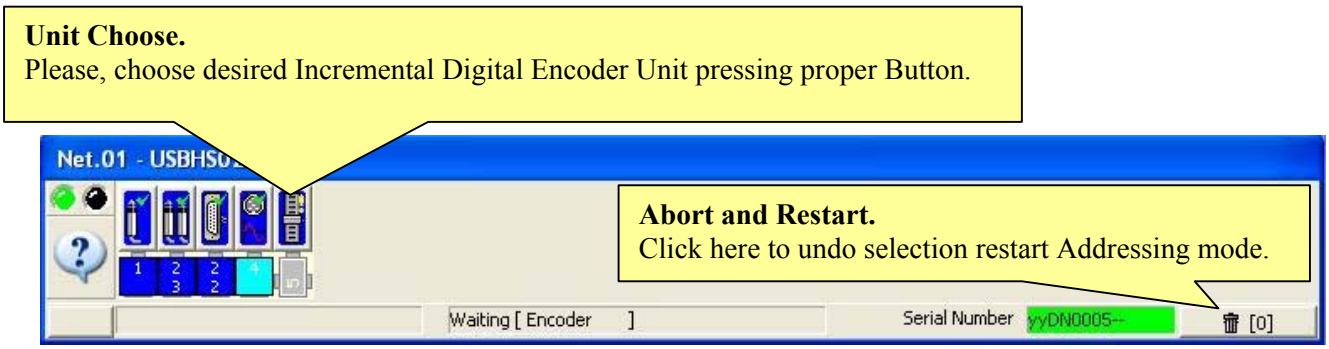


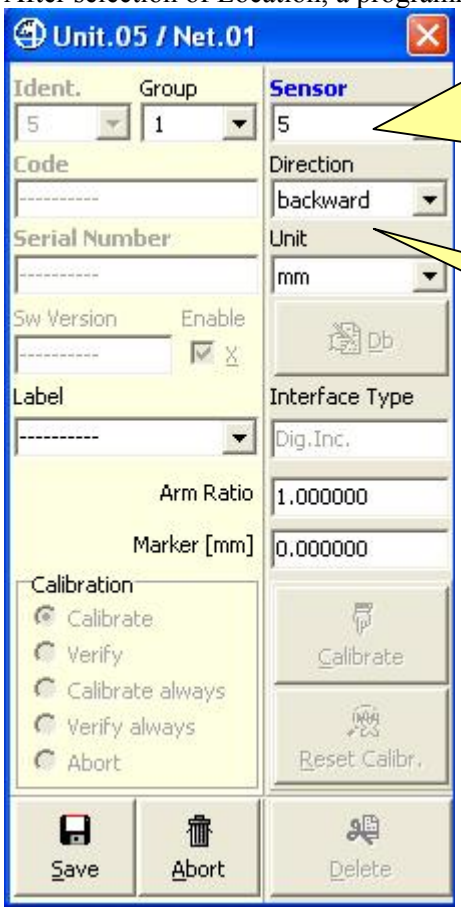
Figure 30: Net Form in On-Line
(example for On-Line Manual Addressing mode, waiting an Analogic Input Unit selection)

Net Form Buttons suggest addressing state of each Analogic Input Unit.
However any Location associated to an Analogic Input Unit can be selected.

Helping with Button Image.	
	No suggest
	Applicant Location
	Just assigned Location

A **Button in Net Form has to be selected**: click on chosen Location.

After selection of Location, a programming window appears.



Sensor Number let User to define a flat map for Measure Point enumeration.
Sensor Number will be used by QSPC software to address Transducer channels, and its value must match with programmed one in QSPC Gauge Programming.
*First available **Sensor** is proposed: it can be changed, if desired, choosing between available ones.*
***Sensor** can be also cleared, with "---" choose.*

Backward **Direction** *is proposed:* Forward *Direction can be optionally chosen.*
[mm] **Unit** *is proposed: it can be optionally changed.*

Figure 31: Analogic Input Unit Addressing Form
(1st selection)

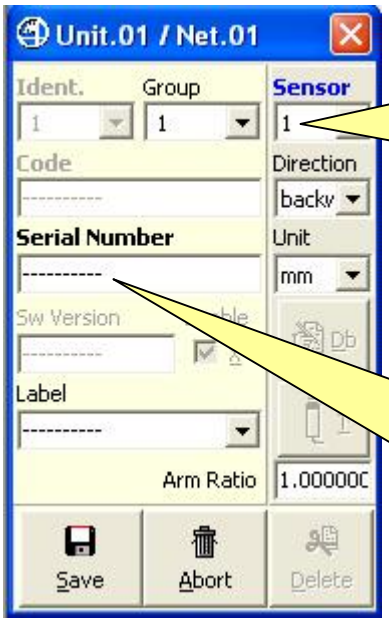
Typically, only Save button has to be clicked.

Relevant Data.	
Sensor Number	Select Sensor Number from a list of available numbers only , Select "---" item to clear current number.
Direction	Backward/Forward.
Unit	Millimeters, Degrees can be chosen .
Marker	Measure Offset.
Arm Ratio	Values between 0.5 and 4.0 can be chosen.
Group	Free for User.
Label	Free for User.

Save , Abort Buttons.	
Save	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
Abort	This button closes window without any saving and restarts addressing operations.

- **LVDT Unit Addressing, manual Serial Number enter.**

Click on LVDT Unit button  and insert Unit production **Serial Number** into the programming field.



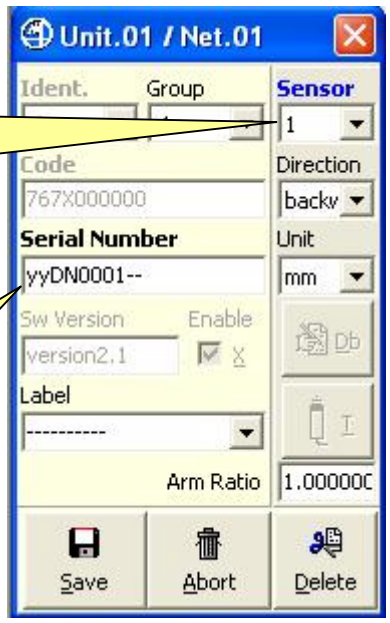


Figure 32: LVDT Unit Addressing Form (1st selection)

Figure 33: LVDT Unit Addressing Form (selection of Unit just Addressed)

Typically, only Save button has to be clicked after having specified proper **Serial Number**.

Relevant Parameters.	
Sensor Number	Select Sensor Number from a list of available numbers only , Select "---" item to clear current number.
Direction	Backward/Forward.
Unit	Millimetres, Degrees, Celsius Degrees, Grams can be chosen .
Arm Ratio	Values between 0.5 and 4.0 can be chosen.
Group	Free for User.
Label	Free for User.

Save , Abort , Delete Buttons.	
Save	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
Abort	This button closes window without any saving and restarts addressing operations.
Delete	This button closes window with data clear (Code, Serial Number, SW Version) and clears Unit Identification Number.

- **LVDT-2 Unit Addressing, manual Serial Number enter.**

Click on LVDT-2 Unit button  and insert Unit production **Serial Number** into the programming field.

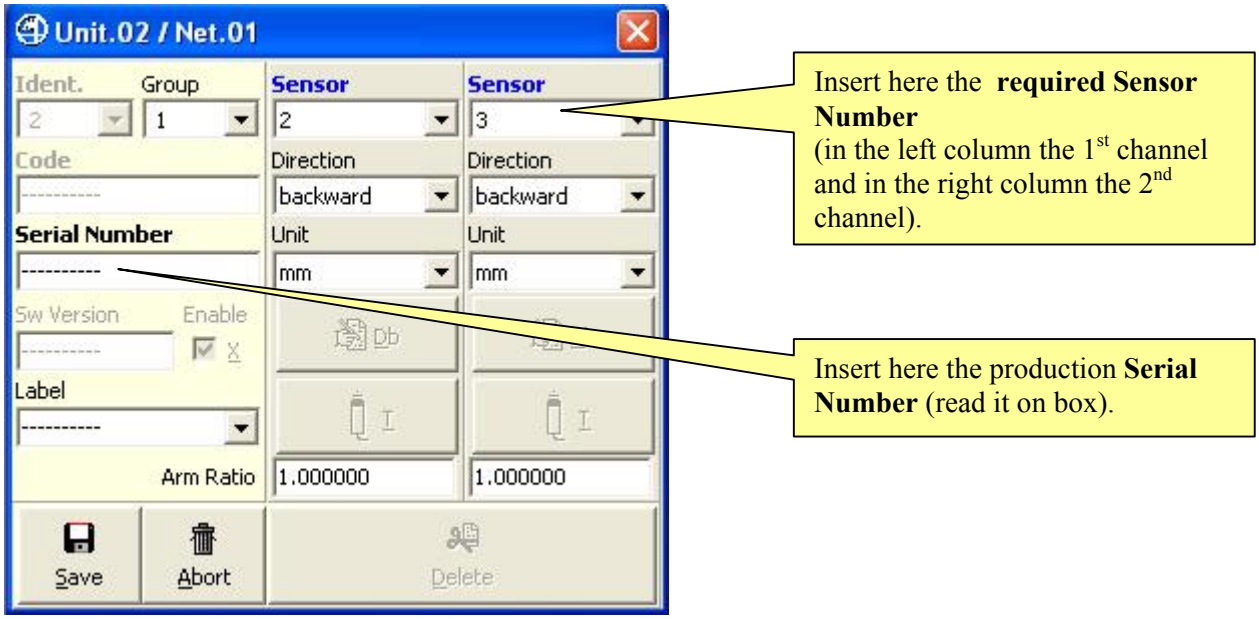


Figure 34: LVDT-2 Unit Addressing Form
(1st selection)

Typically, only Save button has to be clicked after having specified proper **Serial Number**.

Relevant Parameters.	
Sensor Number	Select Sensor Number from a list of available numbers only , Select "---" item to clear current number.
Direction	Backward/Forward.
Unit	Millimetres, Degrees, Celsius Degrees, Grams can be chosen .
Arm Ratio	Values between 0.5 and 4.0 can be chosen.
Group	Free for User.
Label	Free for User.

Save , Abort , Delete Buttons.	
Save	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
Abort	This button closes window without any saving and restarts addressing operations.
Delete	This button closes window with data clear (Code, Serial Number, SW Version) and clears Unit Identification Number.

- **I/O Unit Addressing, manual Serial Number enter.**

Click on I/O Unit button  and insert Unit production **Serial Number** into the programming field.

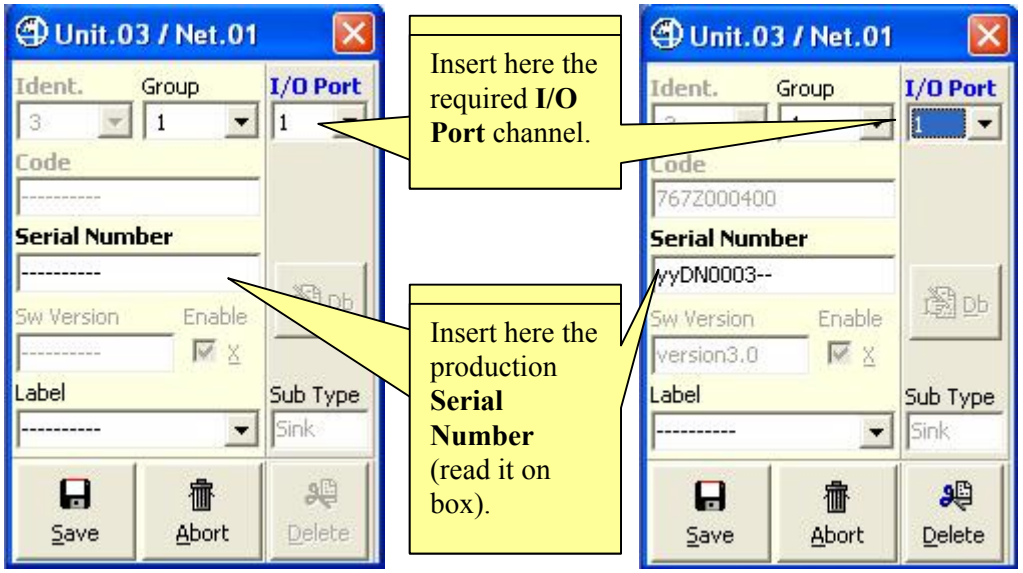


Figure 35: I/O Unit Addressing Form (1st selection)

Figure 36: I/O Unit Addressing Form (selection of Unit just Addressed)

Typically, only Save button has to be clicked after having specified proper **Serial Number**.

Relevant Parameters.	
Input/Output	Select Input/Output Port Number from a list of available numbers only , Select "---" item to clear current number.
Group	Free for User.
Label	Free for User.

Save , Abort , Delete Buttons.	
Save	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
Abort	This button closes window without any saving and restarts addressing operations.
Delete	This button closes window with data clear (Code, Serial Number, SW Version) and clears Unit Identification Number.

- **Analogic Input Unit Addressing, manual Serial Number enter.**

Click on Analogic Input Unit button  and insert Unit production **Serial Number** into the programming field.

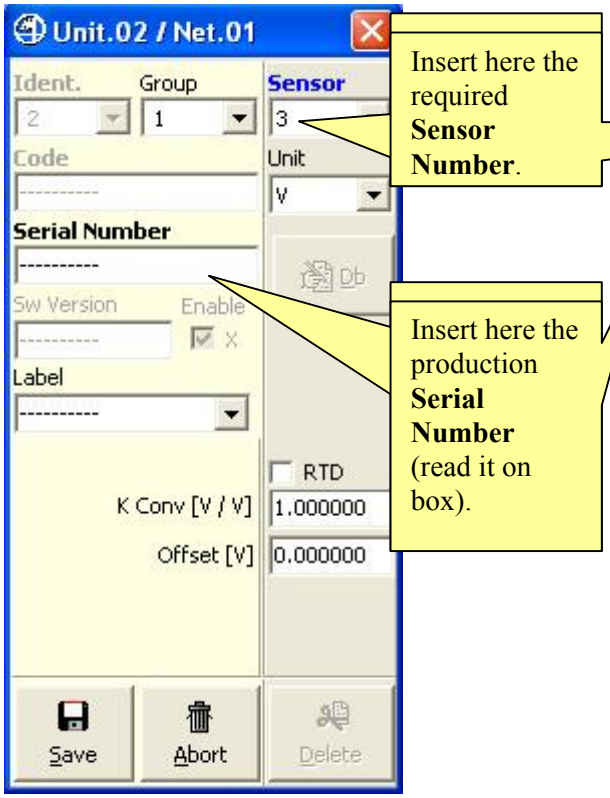


Figure 37: Analogic Input Unit Addressing Form (1st selection)

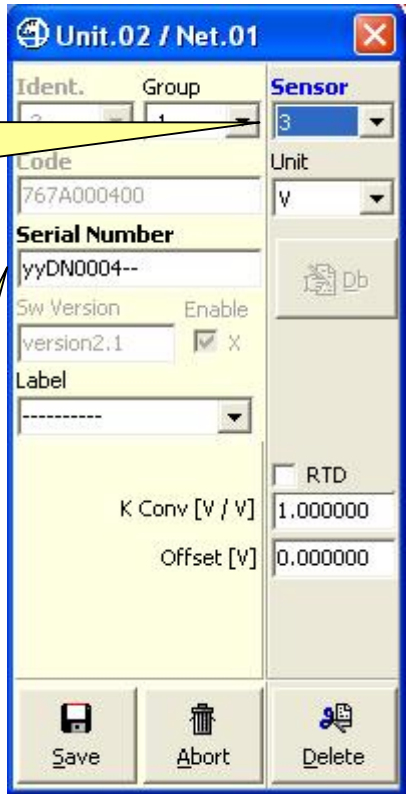
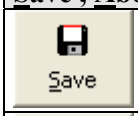


Figure 38: Analogic Input Unit Addressing Form (selection of Unit just Addressed)

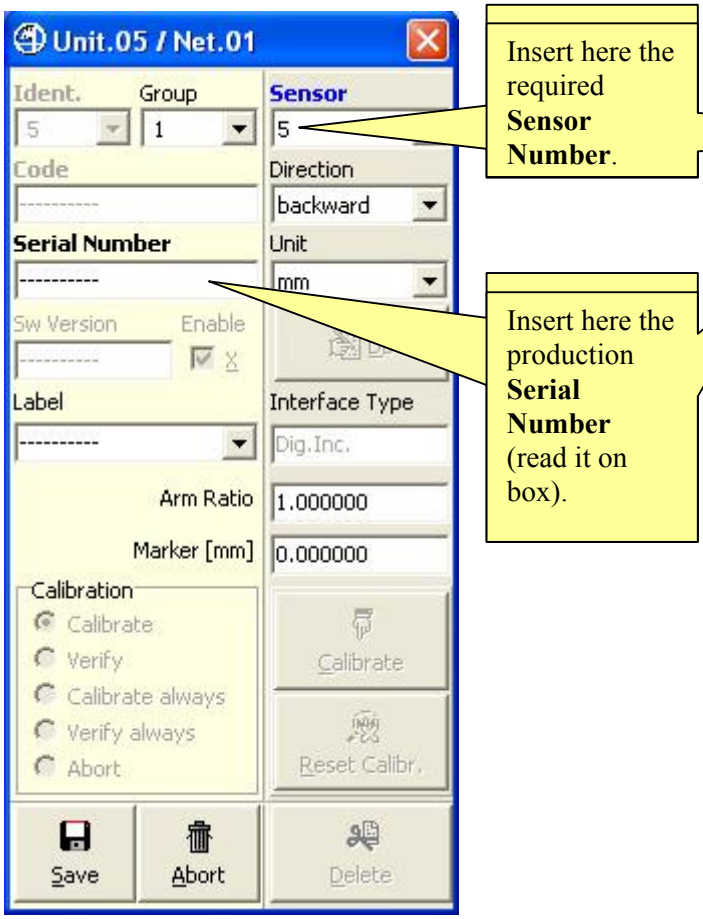
Typically, only Save button has to be clicked after having specified proper **Serial Number**.

Relevant Parameters.	
Sensor Number	Select Sensor Number from a list of available numbers only , Select "---" item to clear current number.
Unit	Millimetres, Degrees, Celsius Degrees, Grams can be chosen .
K Conv	Input conversion factor.
Offset	Input offset.
Group	Free for User.
Label	Free for User.

Save , Abort , Delete Buttons.	
	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
	This button closes window without any saving and restarts addressing operations.
	This button closes window with data clear (Code, Serial Number, SW Version) and clears Unit Identification Number.

- **Incremental Digital or Analog Encoder Unit Addressing, manual Serial Number enter.**

Click on Incremental Digital or Analog Encoder Input Unit button  and insert Unit production **Serial Number** into the programming field.



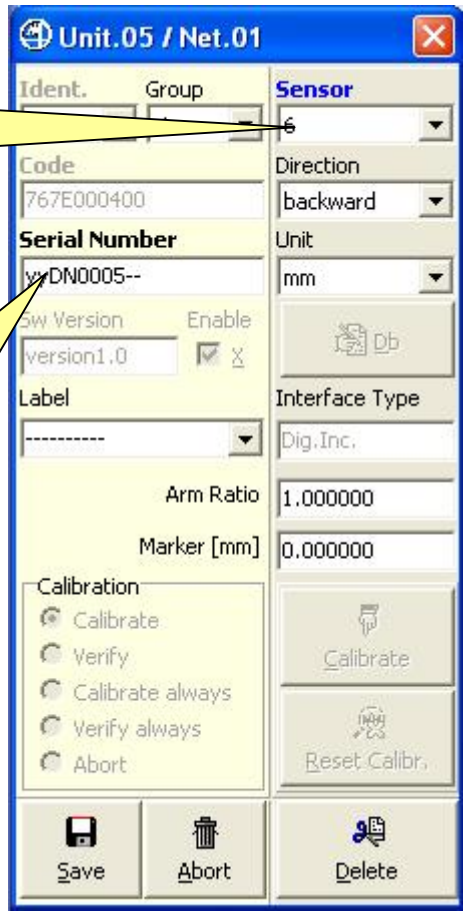
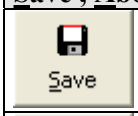


Figure 39: Encoder Unit Addressing Form (1st selection)

Figure 40: Encoder Unit Addressing Form (selection of Unit just Addressed)

Typically, only Save button has to be clicked after having specified proper **Serial Number**.

Relevant Parameters.	
Sensor Number	Select Sensor Number from a list of available numbers only , Select "---" item to clear current number.
Direction	Backward/Forward.
Unit	Millimeters, Degrees can be chosen .
Marker	Measure Offset.
Arm Ratio	Values between 0.5 and 4.0 can be chosen.
Group	Free for User.
Label	Free for User.

Save , Abort , Delete Buttons.	
	This button closes window with data save and starts download of data (Group, Label and Identification Number) to Unit.
	This button closes window without any saving and restarts addressing operations.
	This button closes window with data clear (Code, Serial Number, SW Version) and clears Unit Identification Number.

5.4.8 Automatic Addressing

Automatic Addressing allows to identify LVDT-1-Channel, LVDT-2-Channels, Analogic Input , Encoder Units, and also I/O Units with Input capability.

- **Request of Unit Selection.**

After the establishment of communication, request of Unit Selection is proposed in a dedicated Addressing Mode Panel.

A number indicates the next required :

- Sensor Number

(please, move Transducer related to required Sensor Number)

- Input Port Number

(please, change an Input Bit level related to required Input Port Number)

- **After Unit Selection with Transducer move or Input level change.**

After a Transducer move, Unit is Addressed and current Sensor number is assigned to the Unit involved in Transducer Move or Input Level Change.

- **I/O Manual Unit Selection for I/O box.**

It is possible to manually address an I/O via programming its box **Serial Number**, as previously described.

- **Undo: Clear Sensor Number / Input Port Number**

Undo Button allows user to clear a Sensor Number or an Input Port Number.

After Undo Button click, selection of Sensor Number or an Input Port Number is proposed and a confirm is required.

- **Ok** to clear the specified Sensor Number or an Input Port Number :
  - Sensor Number or Input Port Number is declared free
  - Related Network Unit Identification Number is cleared
  - Automatic Addressing Mode is restarted again
- **Ignore** to abort
  - Automatic Addressing Mode is restarted again

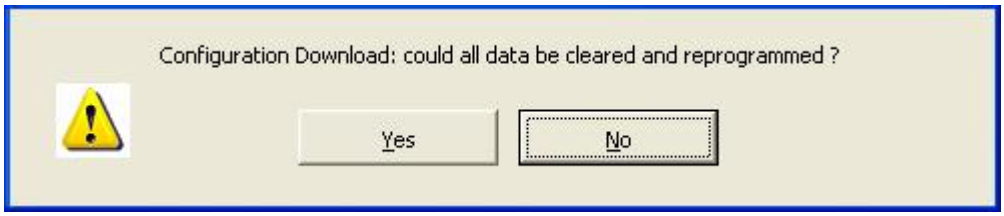
5.5 DownLoad On-Line Session

ToolButtons : DownLoad On-Line Session.
Starts Communication Session.

DownLoad On-Line Session lets user to:

- check if connected HW is able to support loaded configuration
- download loaded configuration in connected HW
- check if stored data matches exactly with loaded one

DownLoad terminates immediately if connected HW is not able to support loaded configuration, without operating any change in Network participants.



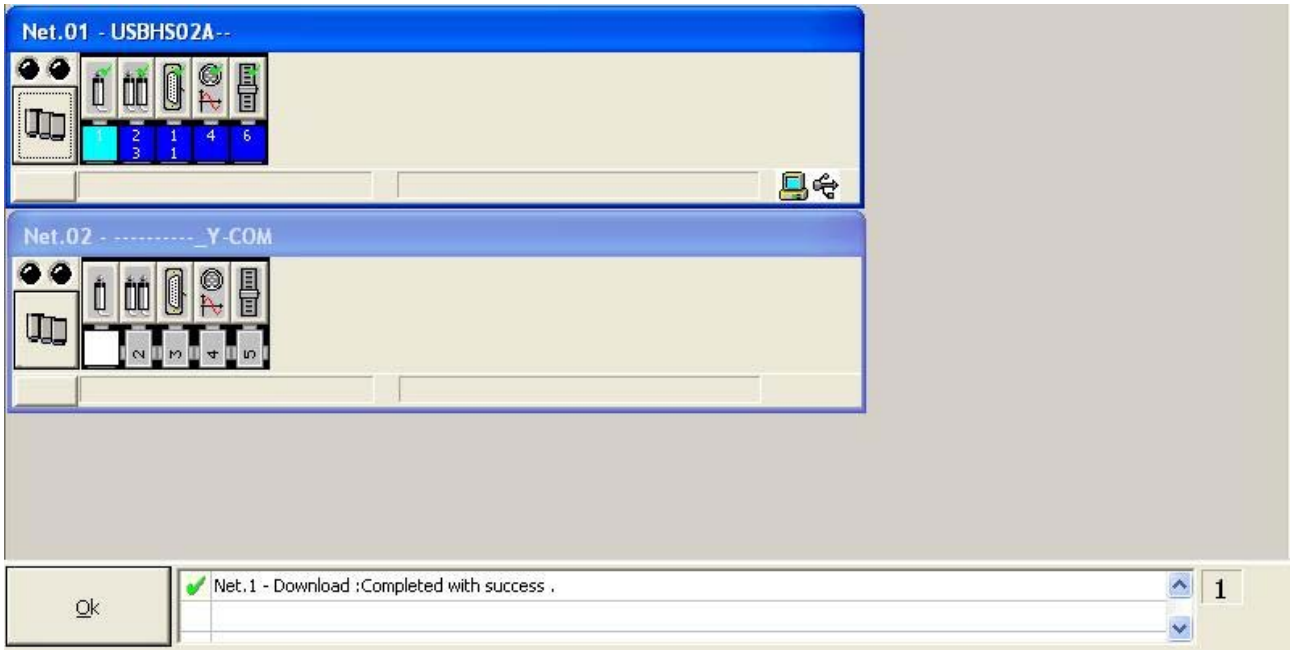


Figure 41: Main Window in Download Mode

Establishment of communication takes some time.
If the establish is not possible a message box appears.

5.5.1.1.1 Termination of communication.

Communication self-terminates when all Unit(s) of all Network(s) were re-programmed .

5.6 Check On-Line Session

Check On-Line Session lets user to:

- check if loaded configuration matches exactly with connected HW

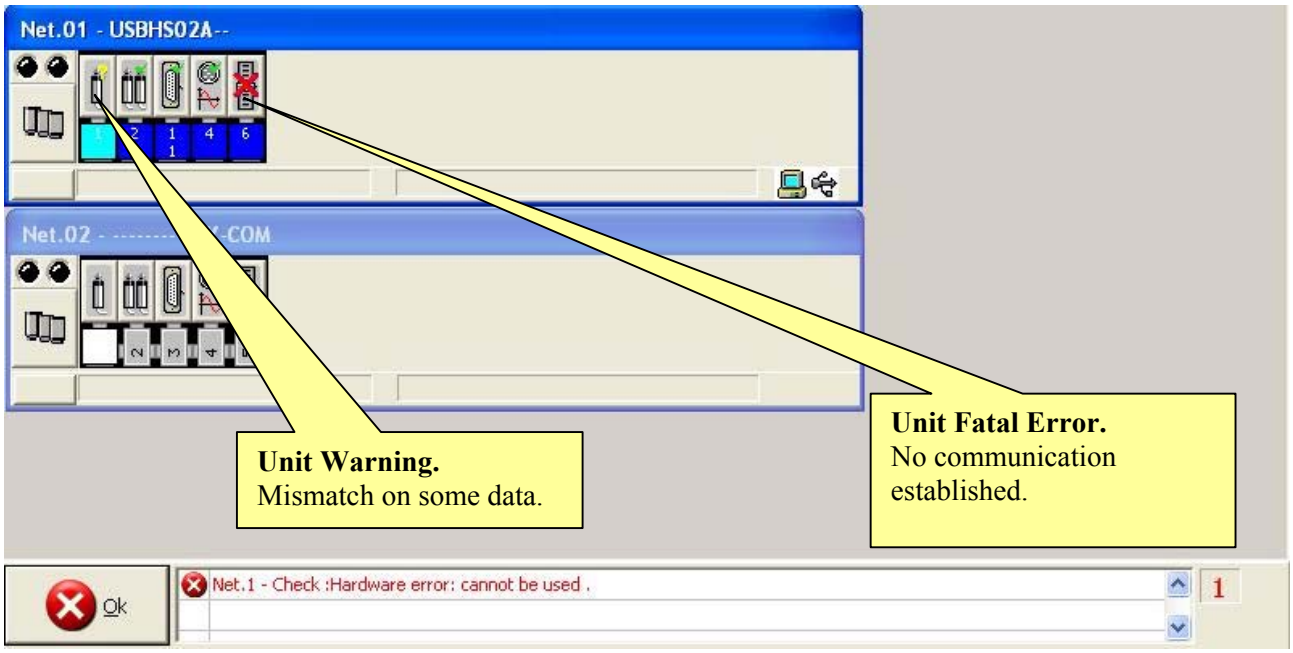
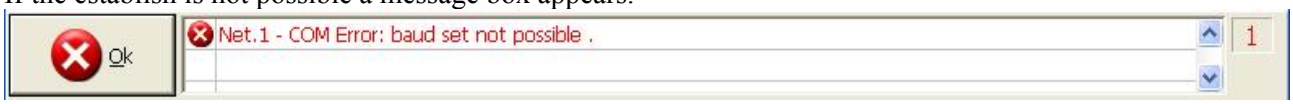


Figure 42: Main Window in Check Mode
(example for On-Line Check mode, 2 Nets , 2nd Net not properly operative)

Establishment of communication takes some time.
If the establish is not possible a message box appears.



5.6.1.1.1 Termination of communication.

Communication self-terminates when all Unit(s) of all Network(s) were checked .

5.7 Operative On-Line Session

ToolButtons : Operative On-Line Session.
Starts Communication Session.

Operative On-Line Session lets user to:

- check functionality of Network globally
- view detailed information about each Net
- view detailed information about each Unit
- view detailed information about error(s) eventually pending
- program Unit parameters

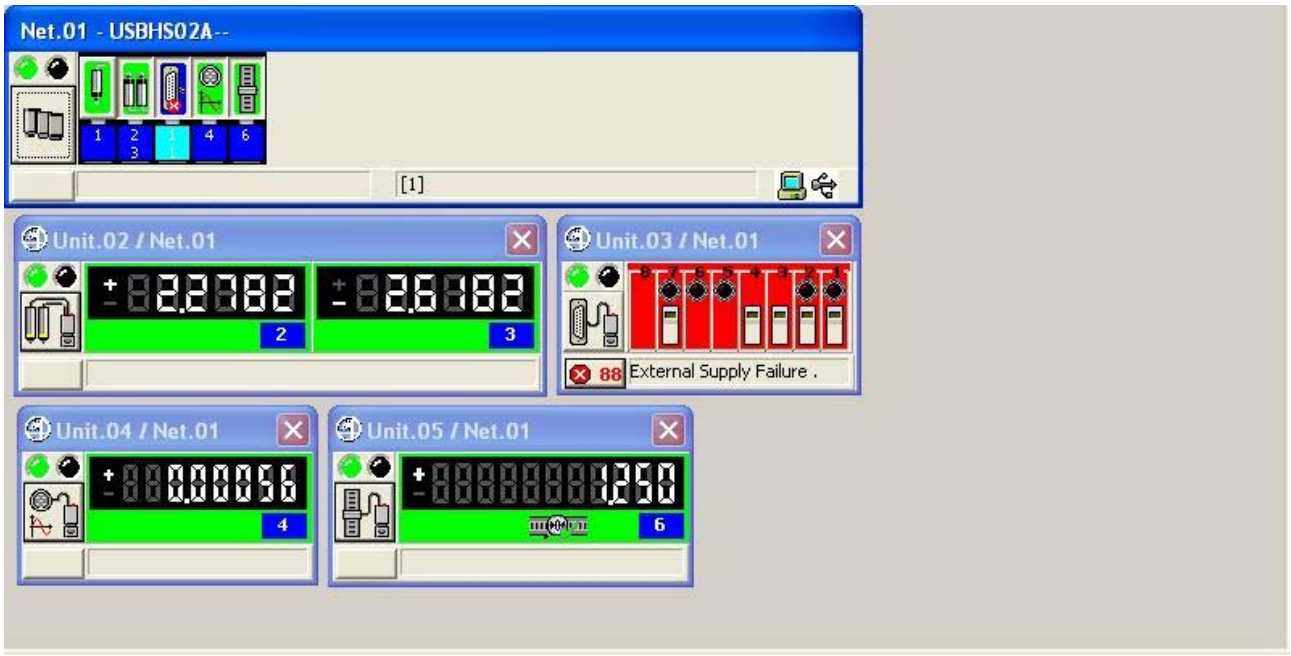
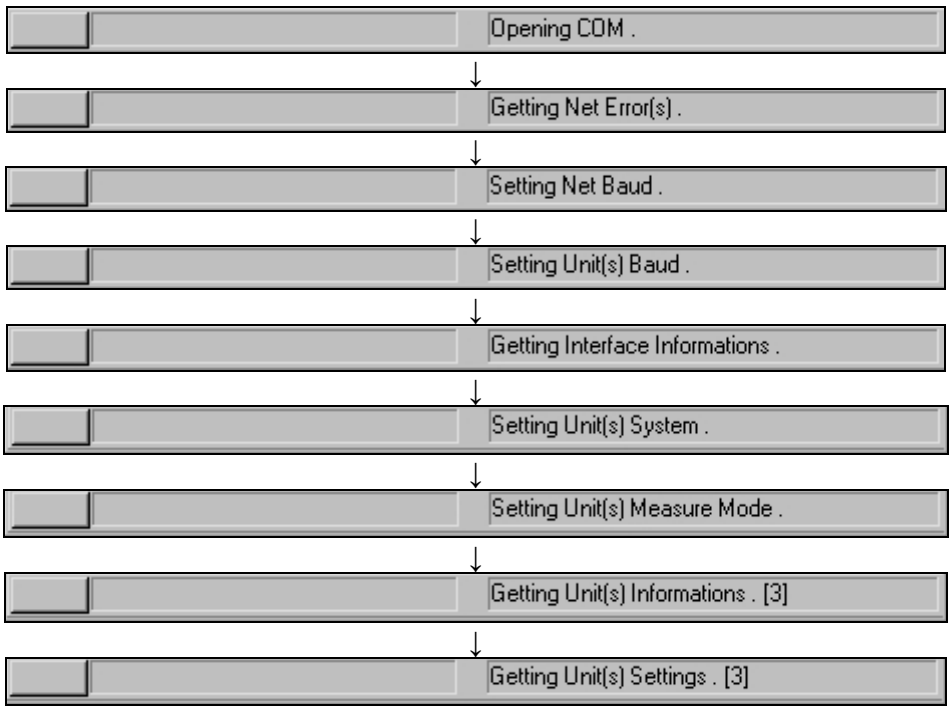


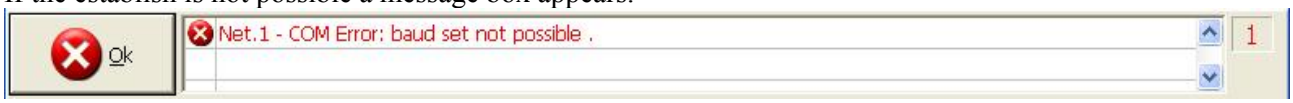
Figure 43: Main Window in Operative Mode
(example for On-Line Operative mode)

5.7.1.1 Establishment of communication.

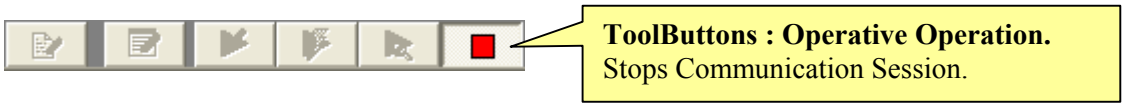
Establishment of communication takes some time.
Minimized/Default/Maximized Button will be operative when establishment terminates.
Status Bar of all Enabled Nets points out current operation progress.



If the establish is not possible a message box appears.



5.7.1.1.1 Termination of communication.



ToolButtons : Operative Operation.
Stops Communication Session.

Status Bar of all enabled Nets points out communication close message.

5.7.1.2 Net Form.

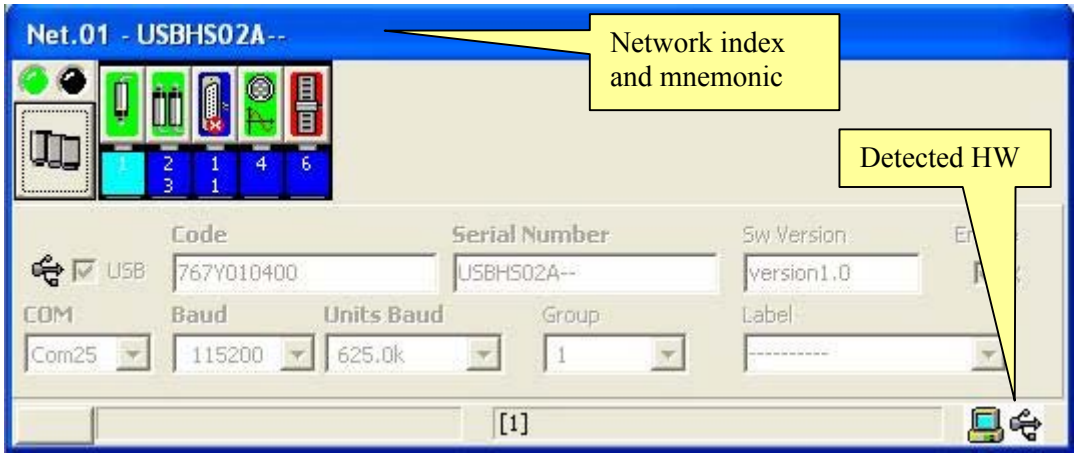
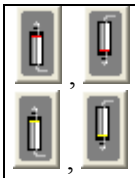


Figure 44: Net Form in On-Line mode
(example for On-Line Operative mode, maximized format)

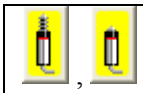
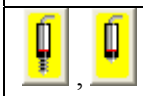
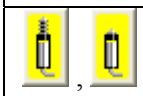
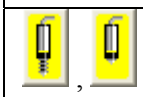
5.7.1.2.1 Detailed description about Unit Button Image meaning, communication started.

LVDT Unit.

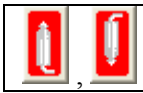
	Unit is not enabled to start communication. **Measure not acquired**. To enable again Unit, please check Enable box: 

	Unit is in transitory state. Colour of ring on Transducer explains Unit Programming: - "red" means that Retentive data on Transducer must not be used - "yellow" means that Retentive data on Transducer must be used Up or down direction on Transducer explains Unit Programming: - up means "forward" direction - down means "backward" direction **Measure in transitory state, not jet properly acquired**.

	Unit is programmed to acquire measure in forward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Measure properly acquired with Transducer in-range**.
	Unit is programmed to acquire measure in backward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Measure properly acquired with Transducer in-range**.
	Unit is programmed to acquire measure in forward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Measure properly acquired with Transducer in-range**.
	Unit is programmed to acquire measure in backward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Measure properly acquired with Transducer in-range**.

	Unit is programmed to acquire measure in forward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Measure properly acquired but with Transducer over-range , released or pressed**.
	Unit is programmed to acquire measure in backward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Measure properly acquired but with Transducer over-range , released or pressed**.
	Unit is programmed to acquire measure in forward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Measure properly acquired but with Transducer over-range , released or pressed**.
	Unit is programmed to acquire measure in backward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Measure properly acquired but with Transducer over-range , released or pressed**.

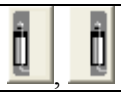
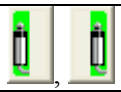
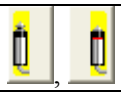
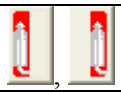
	Unit is programmed to acquire measure in forward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Measure Invalid**.
	Unit is programmed to acquire measure in backward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Measure Invalid**.
	Unit is programmed to acquire measure in forward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Measure Invalid**.
	Unit is programmed to acquire measure in backward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Measure Invalid**.

	**Measure not properly acquired, because Transducer is disconnected**. Please, connect Transducer.

	Unit is not properly running, alarm(s) pending. **Measure could not be properly acquired**. Please, open related Unit Form and verify alarm explanation on Status Bar.

	Impossible to communicate with Unit. **Measure not acquired**. Please, verify if Unit was correctly addressed and if Hardware cabling is correct.

LVDT-2 Unit.
In on-line mode, the button image for the LVDT-2 unit is the combination of 2 images: the left side shows the state of channel 1 and the right side shows the state of channel 2.

	Unit is not enabled to start communication. **Measure not acquired**. To enable again Unit, please check Enable box: 
	Unit in transitory state. **Measure in transitory state, not jet properly acquired**.
	Unit is properly running without alarms. **Measure properly acquired with Transducer in-range**.
	Unit is properly running without alarms. **Measure properly acquired but with Transducer over-range , released or pressed**.
	**Measure not properly acquired, because Transducer is disconnected**. Please, connect Transducer.
	Unit is not properly running, alarm(s) pending. **Measure could not be properly acquired**. Please, open related Unit Form and verify alarm explanation on Status Bar.
	Impossible to communicate with Unit. **Measure not acquired**. Please, verify if Unit was correctly addressed and if Hardware cabling is correct.

I/O Unit.

	Unit is not enabled to start communication. **Input bits not acquired , Output bits not writable**. To enable again Unit, please check Enable box: 
	Unit is in transitory state. **Input bits not jet acquired , Output bits not jet writable**.
	Unit is properly running without I/O alarms. **Input bits properly acquired , Output bits writable**.
	Unit is not properly running, alarm(s) pending. **Input bits acquired but their state is dubious, Output bits probably not writable**. Please, open related Unit Form and verify alarm explanation on Status Bar.
	Impossible to communicate with Unit. **Input bits not acquired , Output bits not writable**. Please, verify if Unit was correctly addressed and if Hardware cabling is correct.

Analogic Input Unit.

	Unit is not enabled to start communication. **Measure not acquired**. To enable again Unit, please check Enable box: 
	Unit is in transitory state. **Measure in transitory state, not jet properly acquired**.
	Unit is properly running without alarms. **Measure properly acquired**.
	Unit is properly running with warning. **Measure properly acquired but in over-range.**
	Unit is not properly running, alarm(s) pending. **Measure could not be properly acquired**. Please, open related Unit Form and verify alarm explanation on Status Bar.
	Impossible to communicate with Unit. **Measure not acquired**. Please, verify if Unit was correctly addressed and if Hardware cabling is correct.

Incremental Digital or Analog Encoder Unit.

	Unit is not enabled to start communication. **Measure not acquired**. To enable again Unit, please check Enable box: 
	Unit is in transitory state. **Measure in transitory state, not jet properly acquired**.
	Unit is properly running without alarms. **Measure properly acquired**.
	Unit is properly running with warning. **Measure properly acquired but in over-range.**
	**Measure not properly acquired, because Encoder is disconnected**. Please, connect Encoder.
	**Measure not properly acquired, because Encoder is in alarm or uncalibrated**. Please, check Encoder cabling and calibrate it. *At boot time, Encoder measure is declared as not calibrated .* *On alarm condition, Encoder measure is declared as not calibrated and alarm code is latched until:* • *an Unit hardware or software reset* • *a request of error get and clear*
	Unit is not properly running, alarm(s) pending. **Measure could not be properly acquired**. Please, open related Unit Form and verify alarm explanation on Status Bar.
	Impossible to communicate with Unit. **Measure not acquired**. Please, verify if Unit was correctly addressed and if Hardware cabling is correct.

5.7.1.3 LVDT Unit Form.

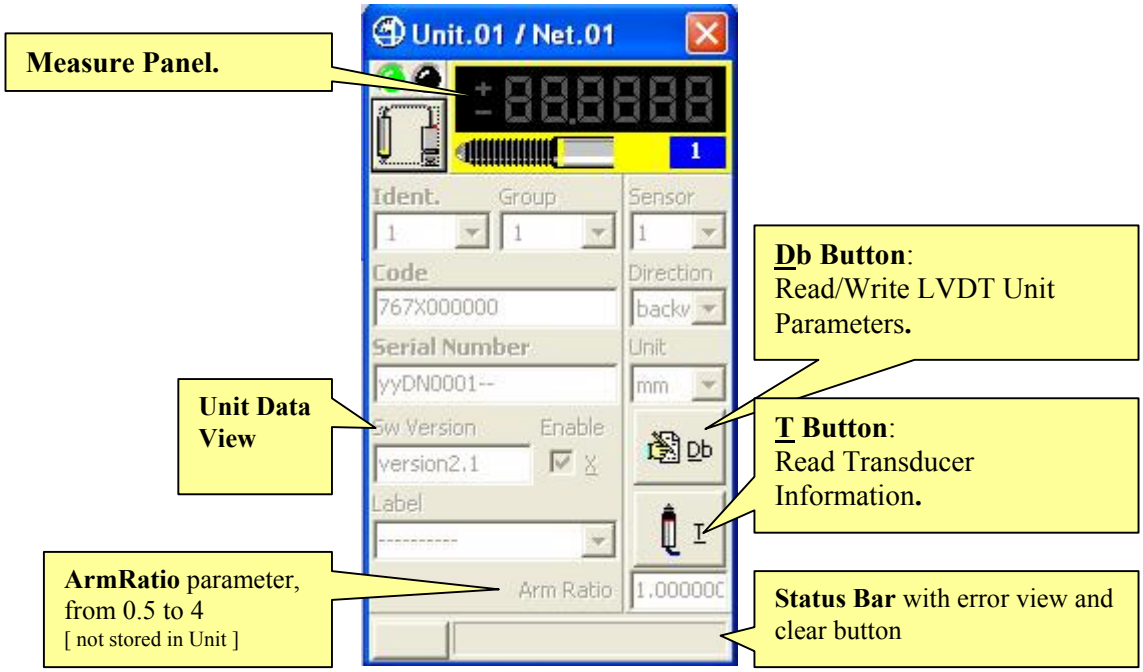
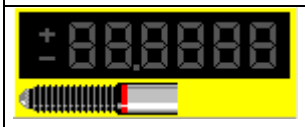
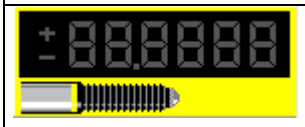


Figure 45: LVDT Unit Form in On-Line mode
(example for On-Line Operative mode, maximized format)

5.7.1.3.1 Measure Panel.

Measure Panel image explanation.	
	Unit in transitory state or Unit programming not appropriate for connected Transducer. **Transducer not jet acquired**.
	Unit is properly working without alarms. **Transducer in range**.
	Unit is programmed to acquire measure in forward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Transducer over range, released or pressed**.
	Unit is programmed to acquire measure in backward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Transducer over range, released or pressed**.
	Unit is programmed to acquire measure in forward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Transducer over range, released or pressed**.
	Unit is programmed to acquire measure in backward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Transducer over range, released or pressed**.
	Unit in alarm. **Transducer not operative** .

5.7.1.3.2 Read/Write LVDT Unit Parameters.

This button opens a dedicated new form for reading or writing the Unit parameters.
All data are uploaded directly from Unit and, on modify, downloaded directly into Unit.

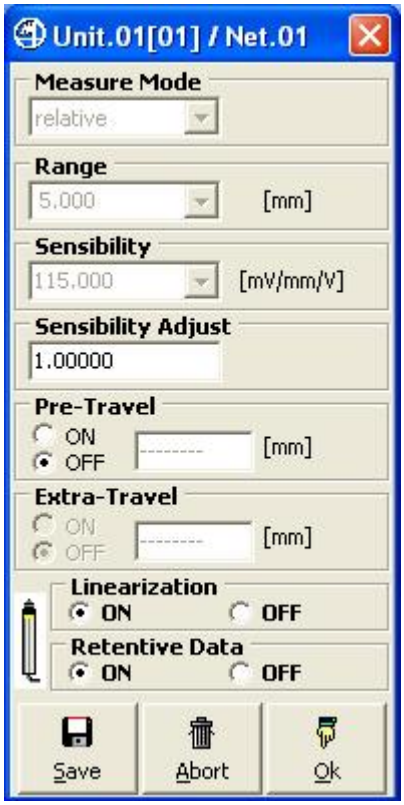


Figure 46: LVDT Unit Parameters Form (example accessing Transducer Data).

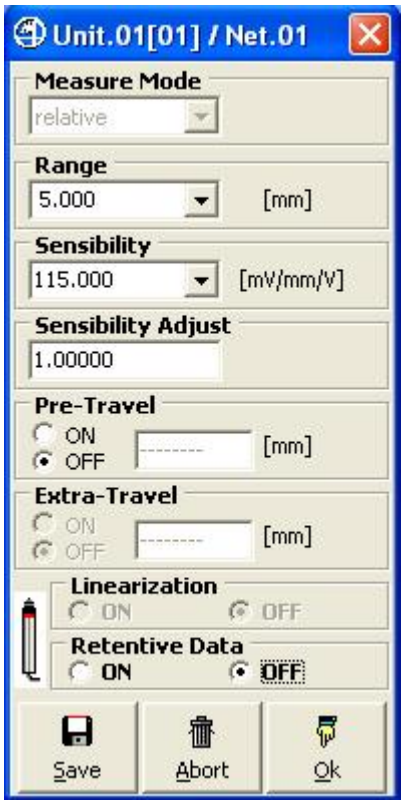
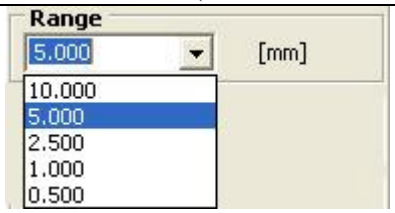
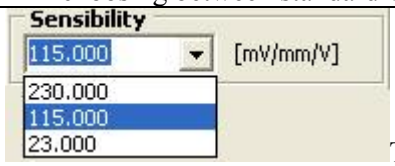
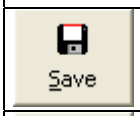


Figure 47: LVDT Unit Parameters Form (example without accessing Transducer Data).

Parameter	**Meaning**
Measure Mode	Measure **Mode** (relative or absolute).
Range	 Transducer **Range** : - self-acquired if accessing Transducer Data (read-only) - to be properly programmed if accessing Transducer Data is disabled, choosing between standard values or entering required one
Sensibility	 Transducer **Nominal Sensibility** : - self-acquired if accessing Transducer Data (read-only) - to be properly programmed if accessing Transducer Data is disabled disabled, choosing between standard values or entering required one
Sensibility Adjust	 Transducer **Sensibility Adjust** : - little adjust on sensibility (1.0000 +/-5%)

Parameter	**Meaning**
Pre-Travel	 Transducer **Pre-Travel** for applying negative limit different from Range

	limit (-OverRange limit override).
Retentive Data and Linearization	 Transducer **Retentive Data Enable** : - ON (default) if retentive chip on Transducer connector must be accessed - OFF if retentive chip on Transducer connector must not be accessed, and Transducer Range and Nominal Sensibility is manually supplied. Transducer **Linearization Data Enable** : - ON (default) if Linearization has to be activated - OFF if pure transducer signal without Linearization has to be acquired

Ok , Save , Abort Buttons.	
	Closes window without saving changes.
	Saves changes to Unit parameters. All data are downloaded directly to Unit. All data are uploaded directly from Unit again
	Aborts changes to Unit parameters. All data are uploaded from Network Unit again.

Note : MDHQspc and MDHQspcP drivers force at communication establishment following settings.

System	**metric**
Measure Mode	**relative**

5.7.1.3.3 Read LVDT Transducer Information.

This button opens a dedicated new form for reading Transducer Information.
All data are uploaded directly from Unit.

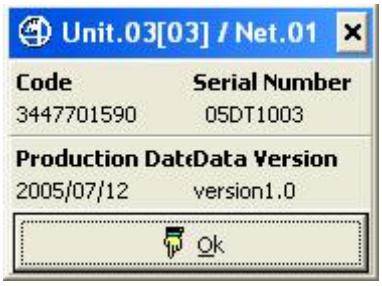


Figure 48: LVDT Unit Transducer Form
(example).

5.7.1.4 LVDT-2 Unit Form.

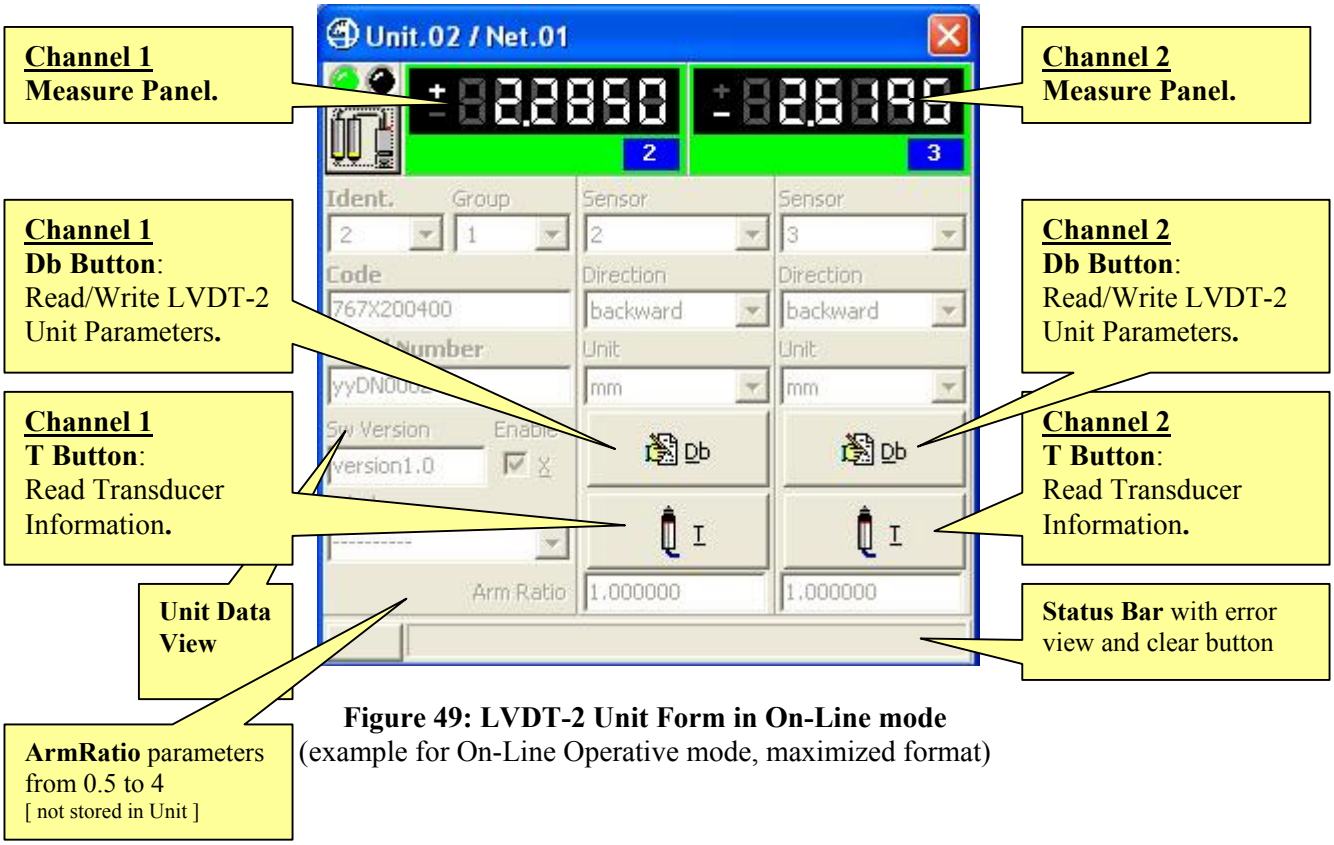
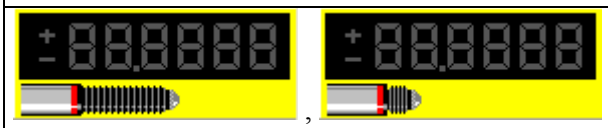
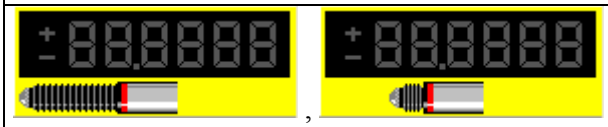
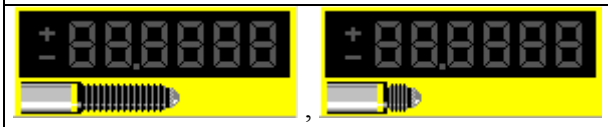
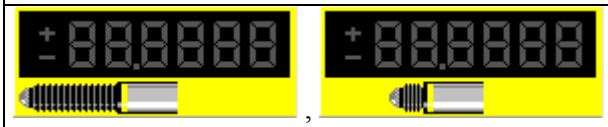


Figure 49: LVDT-2 Unit Form in On-Line mode
(example for On-Line Operative mode, maximized format)

5.7.1.4.1 Measure Panel.

In the LVDT-2 unit form, 2 measure panels are present: the panel on the left side is referred to channel 1 and the panel on the right side is referred to channel 2.

Measure Panel image explanation.	
	Unit in transitory state or Unit programming not appropriate for connected Transducer. **Transducer not jet acquired**.
	Unit is properly working without alarms. **Transducer in range**.
	Unit is programmed to acquire measure in forward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Transducer over range, released or pressed**.
	Unit is programmed to acquire measure in backward direction without accessing Transducer data: Range and Nominal Sensibility have to be properly programmed. **Transducer over range, released or pressed**.
	Unit is programmed to acquire measure in forward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Transducer over range, released or pressed**.
	Unit is programmed to acquire measure in backward direction accessing Transducer data: Range and Nominal Sensibility were self-acquired. **Transducer over range, released or pressed**.
	Unit in alarm. **Transducer not operative** .

5.7.1.4.2 Read/Write LVDT-2 Unit Parameters.

This button opens a dedicated new form for reading or writing the Unit parameters.
All data are uploaded directly from Unit and, on modify, downloaded directly into Unit.

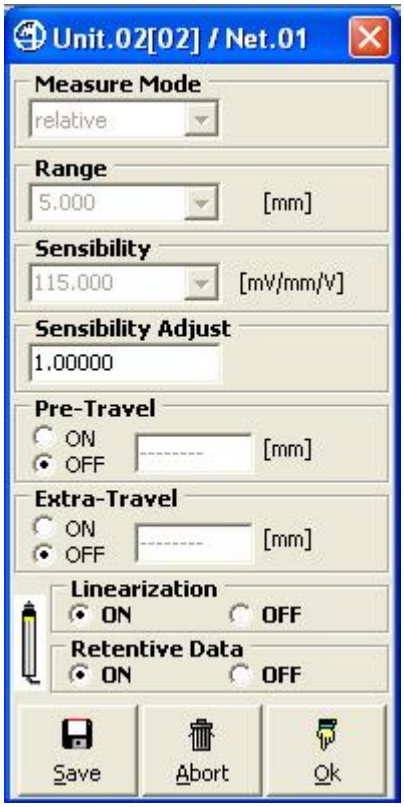


Figure 50: LVDT-2 Unit Parameters Form (example accessing Transducer Data).

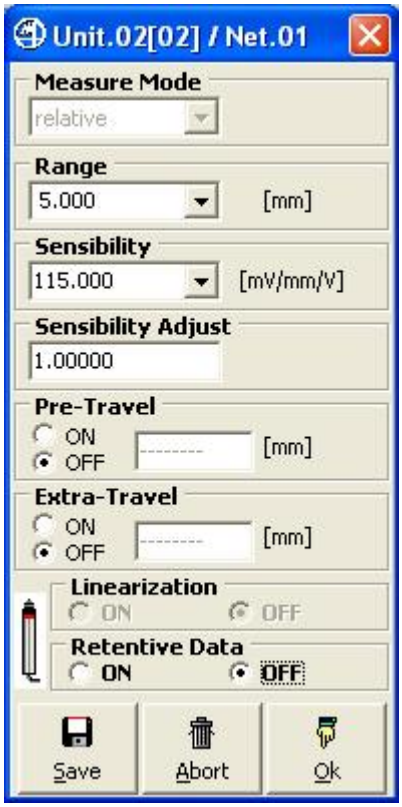
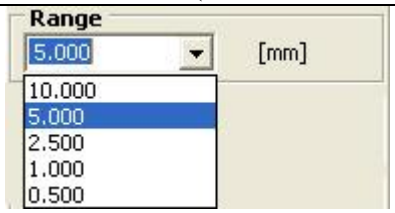
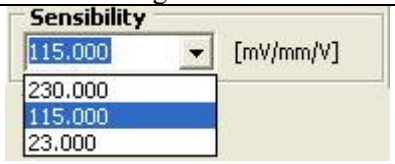
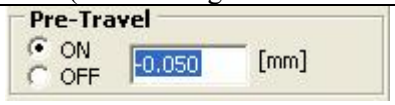


Figure 51: LVDT-2 Unit Parameters Form (example without accessing Transducer Data).

Parameter	**Meaning**
Measure Mode	Measure **Mode** (relative or absolute).
Range	 Transducer **Range** : - self-acquired if accessing Transducer Data (read-only) - to be properly programmed if accessing Transducer Data is disabled, choosing between standard values or entering required one
Sensibility	 Transducer **Nominal Sensibility** : - self-acquired if accessing Transducer Data (read-only) - to be properly programmed if accessing Transducer Data is disabled, choosing between standard values or entering required one
Sensibility Adjust	 Transducer **Sensibility Adjust** : - little adjust on sensibility (1.0000 +/-5%)
Parameter	**Meaning**
Extra-Travel	 Transducer **Extra-Travel** for applying positive limit different from Range

	limit (+OverRange limit override).
Pre-Travel	 Transducer **Pre-Travel** for applying negative limit different from Range limit (-OverRange limit override).
Retentive Data and Linearization	 Transducer **Retentive Data Enable** : - ON (default) if retentive chip on Transducer connector must be accessed - OFF if retentive chip on Transducer connector must not be accessed, and Transducer Range and Nominal Sensibility is manually supplied. Transducer **Linearization Data Enable** : - ON (default) if Linearization has to be activated - OFF if pure transducer signal without Linearization has to be acquired

Ok , Save , Abort Buttons.	
Ok	Closes window without saving changes.
Save	Saves changes to Unit parameters. All data are downloaded directly to Unit. All data are uploaded directly from Unit again
Abort	Aborts changes to Unit parameters. All data are uploaded from Network Unit again.

Note : MDHQspc and MDHQspcP drivers force at communication establishment following settings.

System	**metric**
Measure Mode	**relative**

5.7.1.4.3 Read LVDT-2 Transducer Information.

This button opens a dedicated new form for reading Transducer Information.
All data are uploaded directly from Unit.

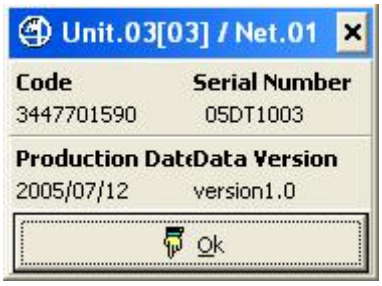


Figure 52: LVDT-2 Unit Transducer Form
(example).

5.7.1.5 I/O Unit Form.

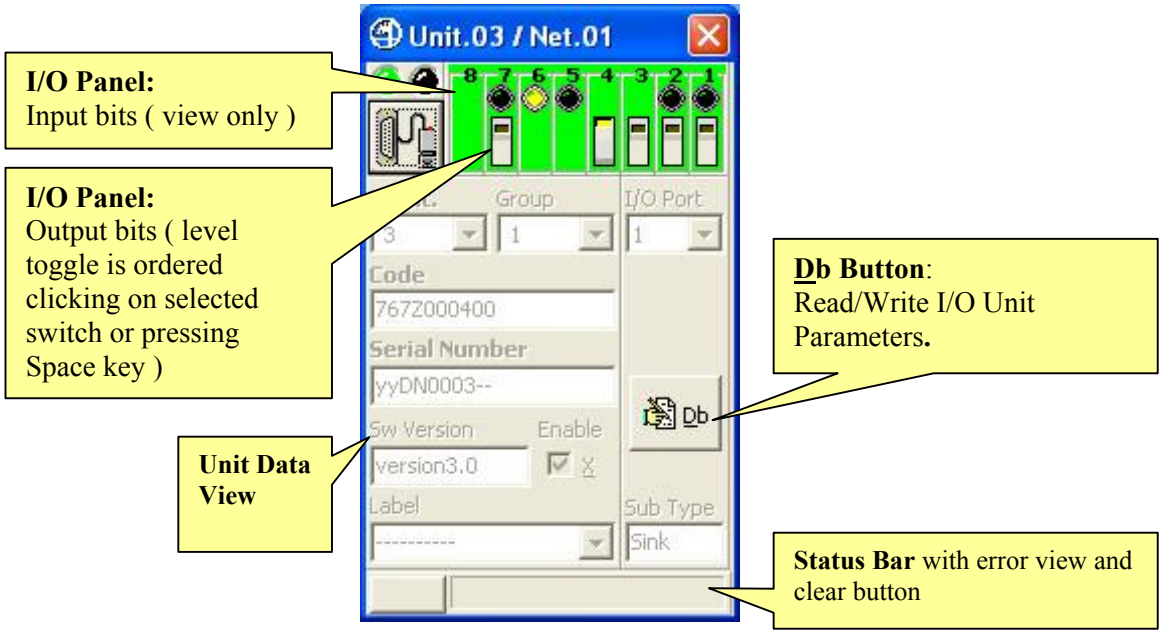
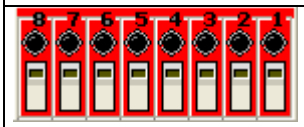


Figure 53: I/O Unit Form in On-Line mode
(example for On-Line Operative mode, maximized format)

5.7.1.5.1 I/O Panel.

I/O Panel behaviour depends on I/O programming.

I/O Panel image explanation .	
	Unit not operative or in transitory state. **Input bits not acquired , Output bits not writable**.
	Unit operative. **Input bits acquired , Output bits writable**.
	Unit not operative, alarm pending. **Input bits not acquired , Output bits not writable**.

5.7.1.5.2 Read/Write I/O Unit Parameters.

This button opens a dedicated new form for reading or writing the Unit parameters.
All data are uploaded directly from Unit and, on modify, downloaded directly into Unit.

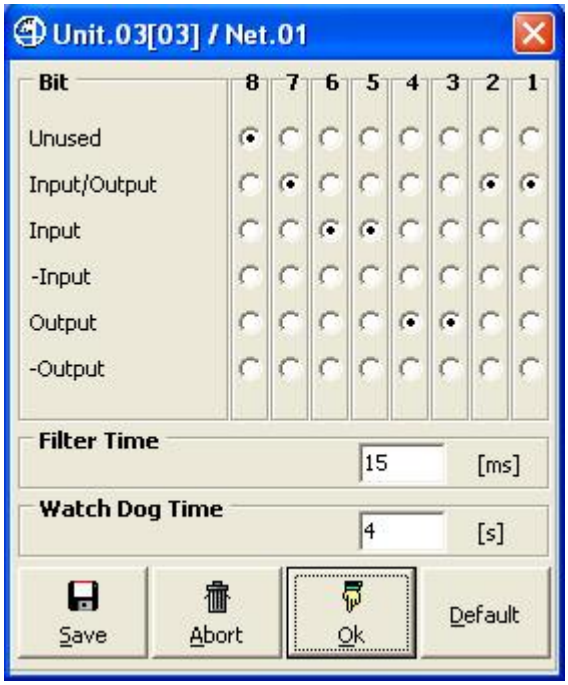
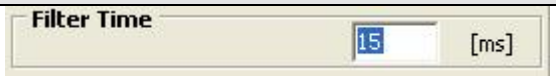
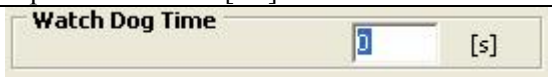
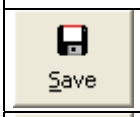


Figure 54: I/O Unit Parameters Form
(example with mixed bits programming).

Parameter	Meaning
Unused	Bit unused.
Input/Output	Bit can be used as input or output.
Input	Bit can be used as input only
-Input	Bit can be used as negative input only.
Output	Bit can be used as output only
-Output	Bit can be used as negative output only

Parameter	Meaning
Filter Time	 Input **Filter Time** [ms].
Watch Dog	 Output **Watch Dog Time** [s] , default 0 [s]. If no communication is detected in this time, all Output bit are cleared. If 0 [s] is programmed, Watch Dog is disabled.

Ok , Save , Abort , Default Buttons.	
	Close window without saving changes.
	Saves changes to Unit parameters. All data are downloaded directly to Unit. All data are uploaded directly from Unit again
	Aborts changes to Unit parameters. All data are uploaded from Network Unit again.
	Restores Default parameters.

5.7.1.6 Analogic Input Unit Form.

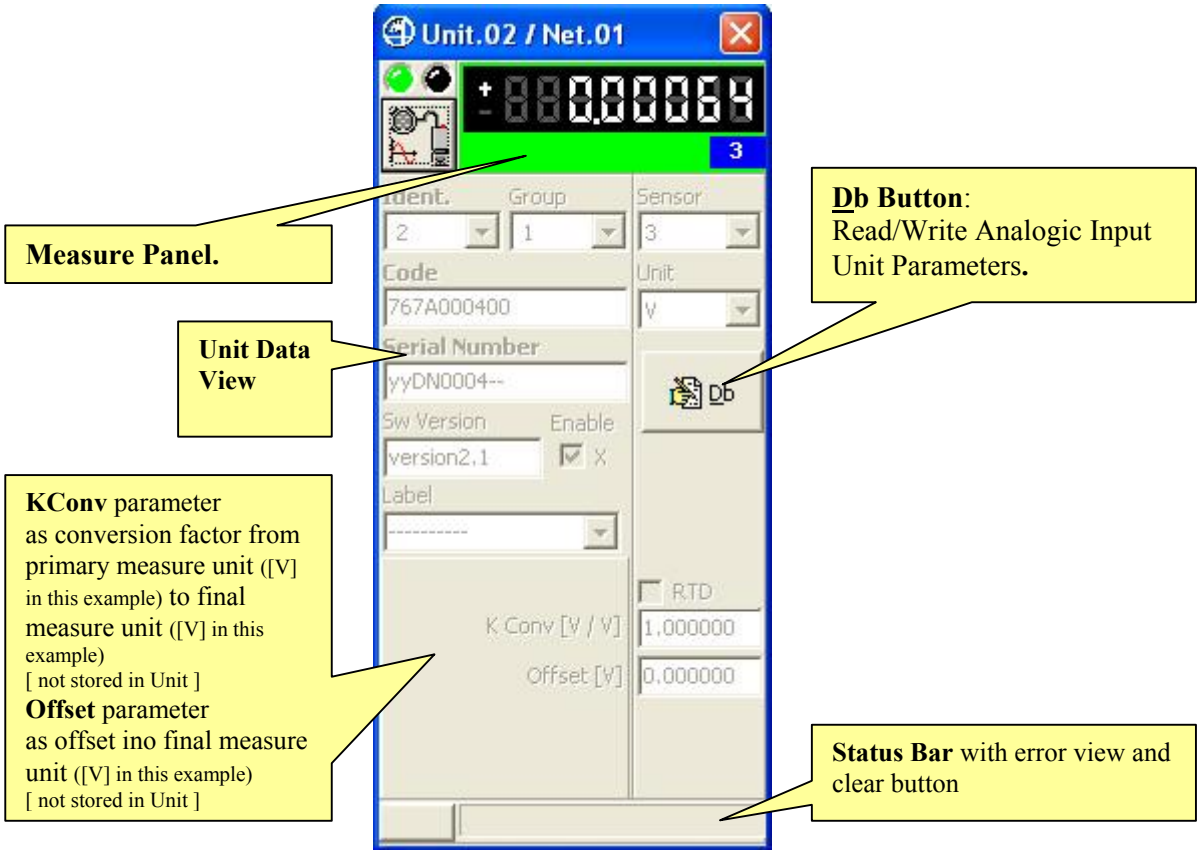


Figure 55: Analogic Input Unit Form in On-Line mode
(example for On-Line Operative mode, maximized format)

5.7.1.6.1 Measure Panel.

Measure Panel image explanation.	
	Unit in transitory. **Input not jet acquired**.
	Unit is properly working without alarms. **Input in range**.
	Unit is properly working with warning. **Input out of range**.
	Unit in alarm.

5.7.1.6.2 Read/Write Analogic Input Unit Parameters.

This button opens a dedicated new form for reading or writing the Unit parameters.
All data are uploaded directly from Unit and, on modify, downloaded directly into Unit.

Sensor Type Parameter let choose between 4 available acquisition modes:

- Voltage [V] with capability of programmable output Voltage Reference
- Resistance [Ohm]
- Current [mA]
- Current loop [4mA – 20mA]

Parameter Form behaviour depends on **Sensor Type** Parameter programmed value .

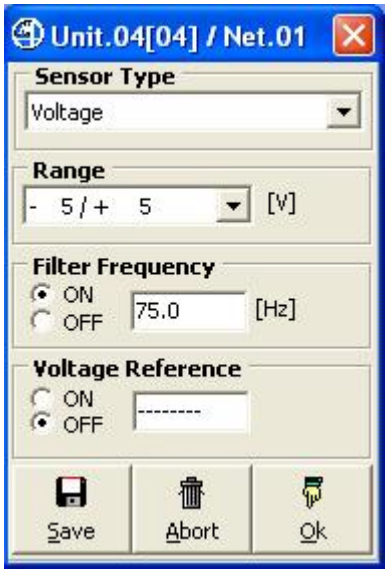


Figure 56: Analogic Input Unit Voltage [V] Parameters Form

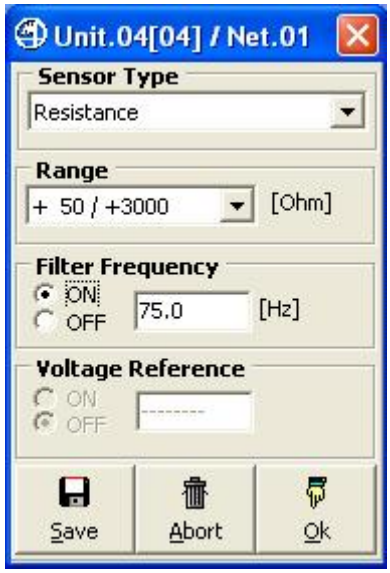


Figure 571: Analogic Input Unit Resistance [Ohm] Parameters Form

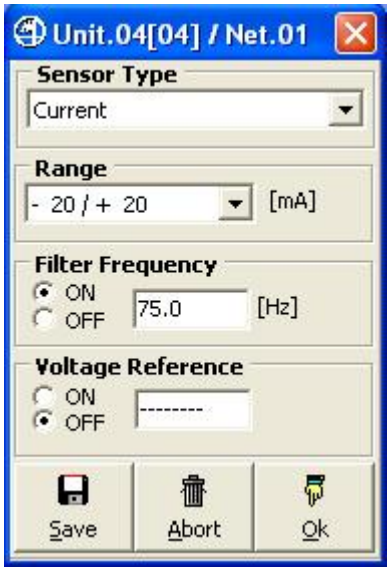


Figure 58: Analogic Input Unit Current [mA] Parameters Form

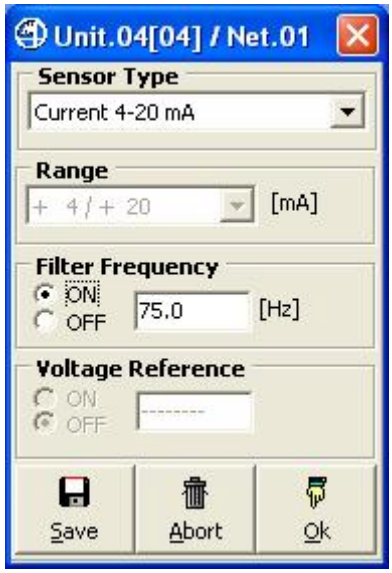
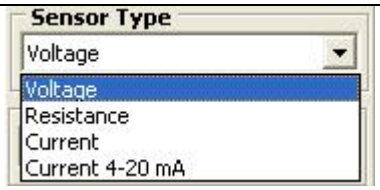
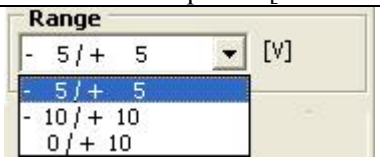


Figure 591: Analogic Input Unit Current loop [4÷20mA] Parameters Form

Parameter	Meaning

Sensor Type	 **Sensor Type** - Voltage [V] with output Voltage Reference - Resistance[Ohm] - Current [mA] - Current loop [4÷20mA]
Range (except in Current loop mode)	  Input **Range**
Filter Frequency	Input **Filter Frequency** [Hz]
Voltage Reference (only in Voltage mode)	Output **Voltage Reference** [V]

Ok , Save , Abort Buttons.	
Ok	Closes window without saving changes.
Save	Saves changes to Unit parameters. All data are downloaded directly to Unit. All data are uploaded directly from Unit again
Abort	Aborts changes to Unit parameters. All data are uploaded from Network Unit again.

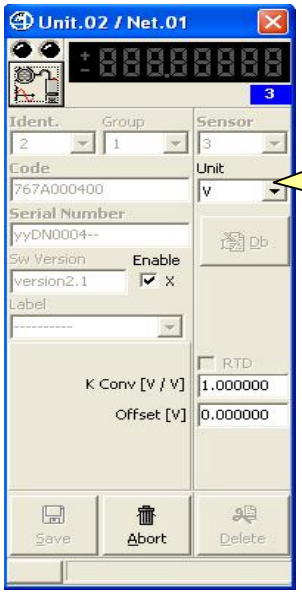
5.7.1.6.3 Changing final Measure Unit.

Depending on  DataBase **Sensor Type** Parameter choose (between 4 available acquisition modes) :

- Voltage [V] with capability of programmable output Voltage Reference
- Resistance [Ohm]
- Current [mA]
- Current loop [4mA – 20mA]

following measure unit can be selected .

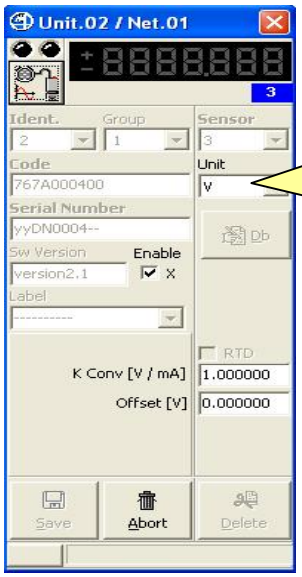
5.7.1.6.3.1 Voltage case .



[V] **Unit** *is proposed as default but can be optionally changed as required :*

- *---*
- *mm*
- *deg*
- *°C*
- *gr*
- *N*
- *Pa*
- *V*
- *mA*
- *Ohm*
- *N * m*
- *mm / s ^{2}*
- *Rad / s*
- *Rad / s ^{2}*
- *dm ^{3} / s*

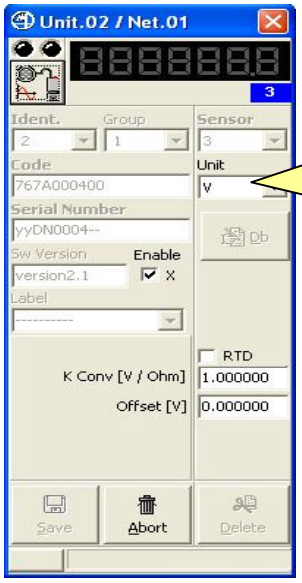
5.7.1.6.3.2 Current case .



[V] **Unit** *is proposed as default but can be optionally changed as required :*

- *---*
- *mm*
- *deg*
- *°C*
- *gr*
- *N*
- *Pa*
- *V*
- *mA*
- *Ohm*
- *N * m*
- *mm / s ^{2}*
- *Rad / s*
- *Rad / s ^{2}*
- *dm ^{3} / s*

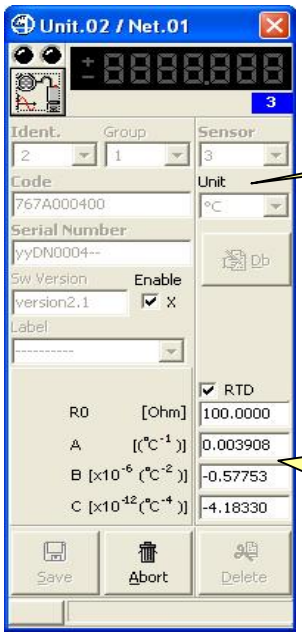
5.7.1.6.3.3 Resistance case (no RTD [Resistor Temperature Detection] choose) .



[V] **Unit** *is proposed as default but can be optionally changed as required :*

- *---*
- *mm*
- *deg*
- *°C*
- *gr*
- *N*
- *Pa*
- *V*
- *mA*
- *Ohm*
- *N * m*
- *mm / s ^{2}*
- *Rad / s*
- *Rad / s ^{2}*
- *dm ^{3} / s*

5.7.1.6.3.4 Resistance case (RTD [Resistor Temperature Detection] choose) .



[°C] **Unit** *is proposed as default and can not be changed :*

- *°C*

RTD *parameters can be freely programmed , according to :*

- range: **-200°C / 0 °C :**
  $Rt = Ro [1+At+Bt^2+C (t- Ro) t^3]$
- range: **0 °C / 850 °C :**
  $Rt = Ro (1+At+Bt^2)$

Tipical parameters for Platinum [Pt] resistors :
A = 0.003908
B = -0.57753
C = -4.18330

Tipical parameters for Nickel [Ni] resistors :
A = 0.005845
B = 6.650
C = 28.05

5.7.1.7 Incremental Digital or Analog Encoder Unit Form.

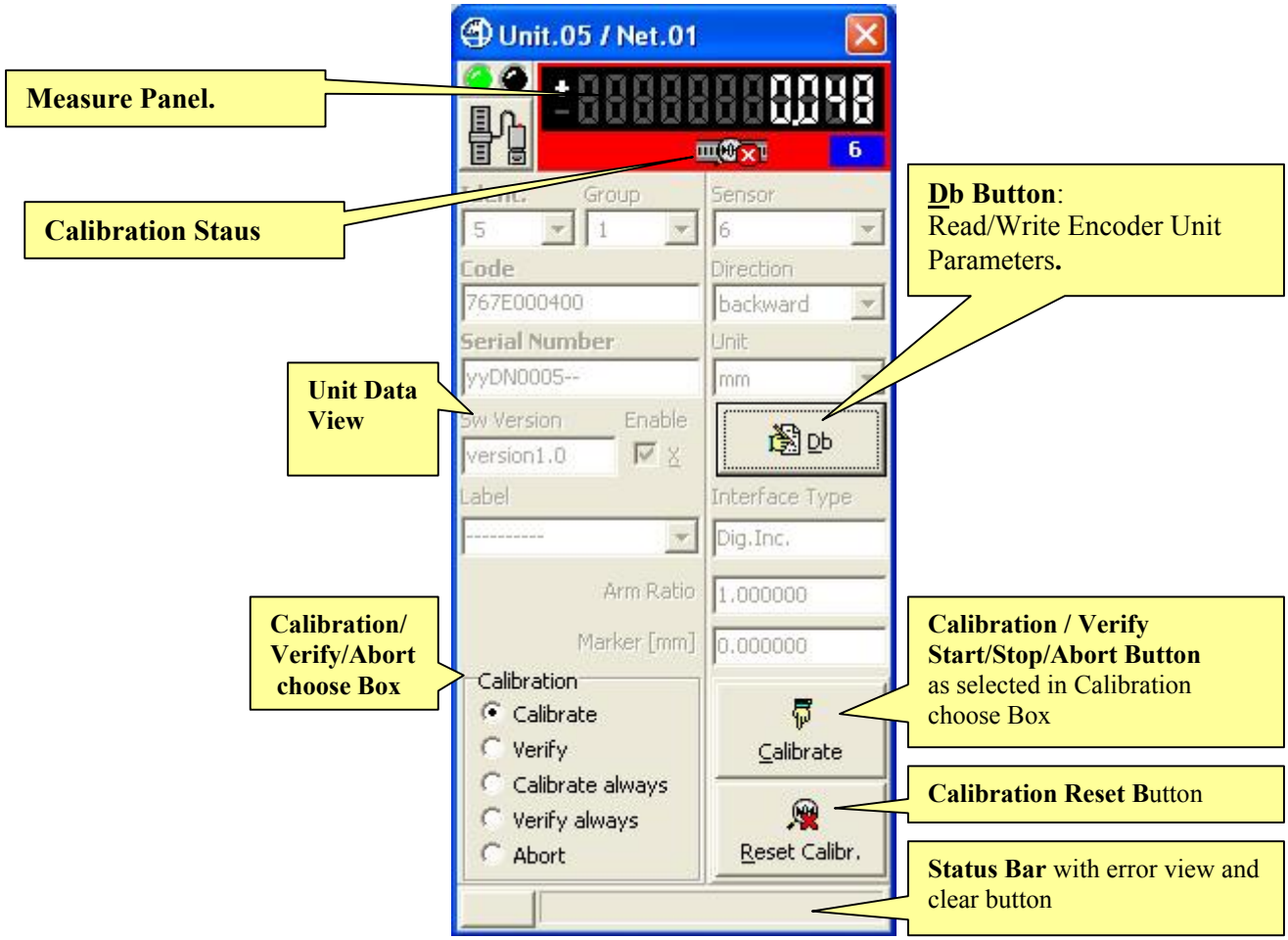


Figure 60a: Incremental Digital Encoder Unit Form in On-Line mode
(example for On-Line Operative mode, maximized format)

Calibration/Verify/Abort choose Box let select a Calibration/Verify cycle for further start or select the Abort for further stop.

Calibration/Verify Start/Stop/Abort Button let starting a calibration or verify cycle or stopping it.
Calibration/Verify Cycle can be:
- single (1st Marker signal detection calibrates/verifies Unit), and must be stopped or aborted
- never-ending (all Markers signal detection calibrate/verify Unit), and can be aborted if required

Calibration Reset Button let erase immediately zeroings on Unit, forcing its state to not calibrated.

If Marker signal is programmed OFF (not provided):
- *single calibration and verify are immediate*
- *never-ending calibration and verify are not supported*

While for the Incremental Analog Encoder there is only a different string on the “Interface Type” detected, however the figure is:

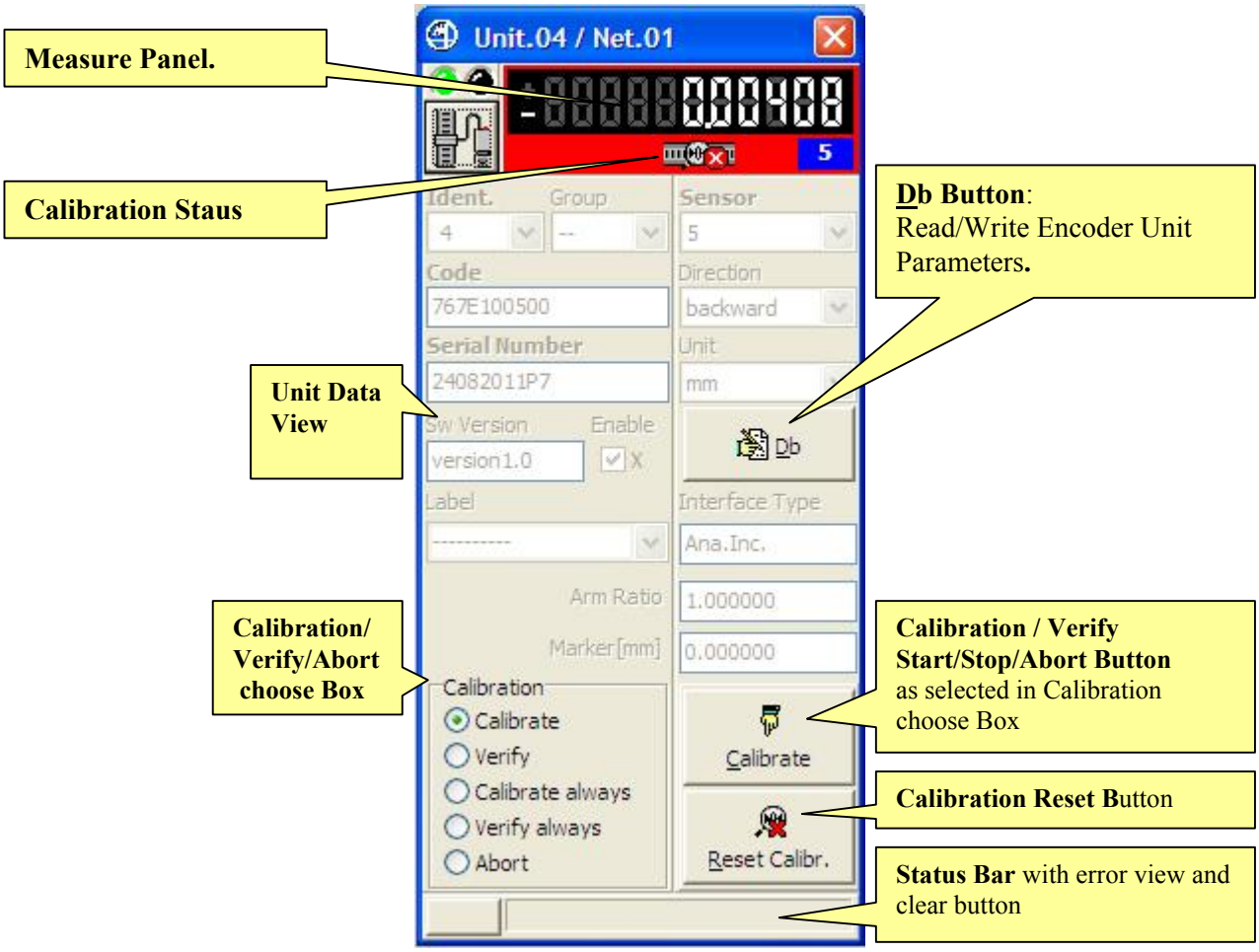
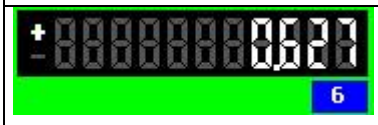


Figure 60b: Incremental Analog Encoder Unit Form in On-Line mode
(example for On-Line Operative mode, maximized format)

The meaning of every box is the same described before on the Digital.

5.7.1.7.1 Measure Panel.

Measure Panel image explanation.	
	Unit in transitory. **Input not jet acquired**. **Encoder not calibrated**.
	Unit in transitory. **Input not jet acquired**. **Encoder calibrated.**
	Unit in alarm. **Encoder not connected**. **Encoder Phase-A , Phase-B , Marker signal wrongly connected.** **Encoder Alarm or Over-Speed.**
	Unit is properly working in not calibrated state. **Encoder not calibrated**.
	Unit is properly working in not calibrated state. **Encoder not calibrated , calibration cycle pending.**
	Unit is properly working in calibrated state. **Encoder calibrated , calibration done with success.** **Measure in range.**
	Unit is properly working in calibrated state. **Encoder calibrated , verify cycle pending.** **Measure in range.**
	Unit is properly working in calibrated state. **Encoder calibrated , calibration verify done with success (match).** **Measure in range.**
	Unit is properly working in calibrated state. **Encoder calibrated , calibration verify done with error (unmatch).** **Measure in range.**
	Unit is properly working in calibrated state. **Encoder calibrated , no verify information available.** **Measure in range.**
	Unit is working with over-range warning. **Encoder calibrated .** **Measure out of range.**
	Unit is working with over-range warning. **Encoder not calibrated .** **Measure out of range.**

5.7.1.7.2 Read/Write Incremental Digital or Analog Encoder Unit Parameters.

This button opens a dedicated new form for reading or writing the Unit parameters.
All data are uploaded directly from Unit and, on modify, downloaded directly into Unit.

Sensor Type Parameter let choose between 4 available acquisition modes:

- Linear [mm]
- Rotary [degrees]
- Periodic [degrees with 360° module]
- Counter [no unit as default , unit programmable as required]

Parameter Form behaviour depends on **Sensor Type** Parameter programmed value (These figures are referred to a Digital unit for an Analog unit see after these figures).

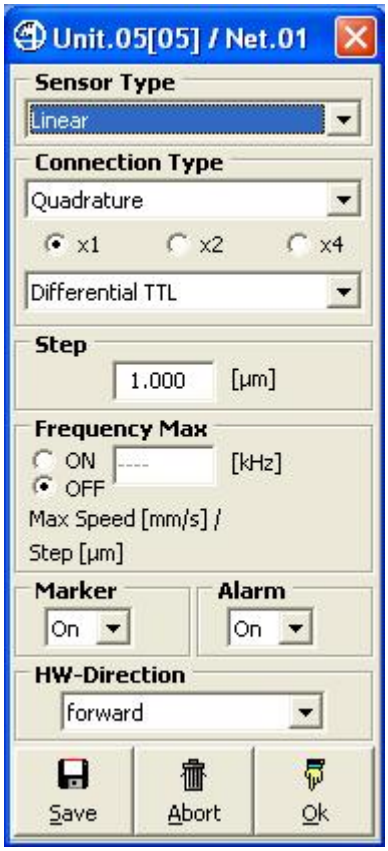


Figure 61: Digital Encoder Unit Linear Parameters Form

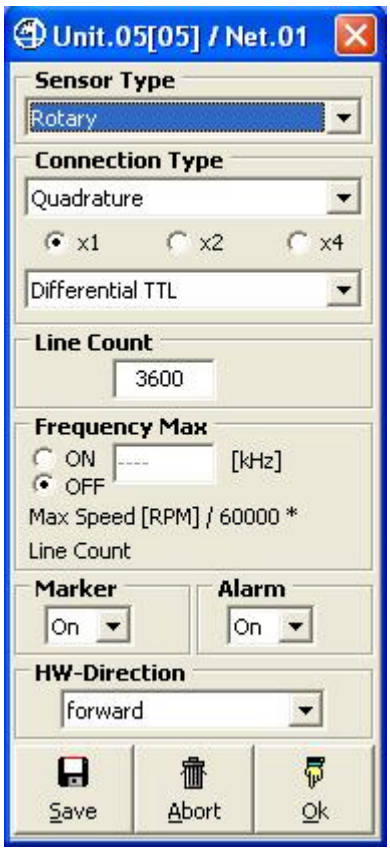


Figure 62: Digital Encoder Unit Rotary [degrees] Parameters Form

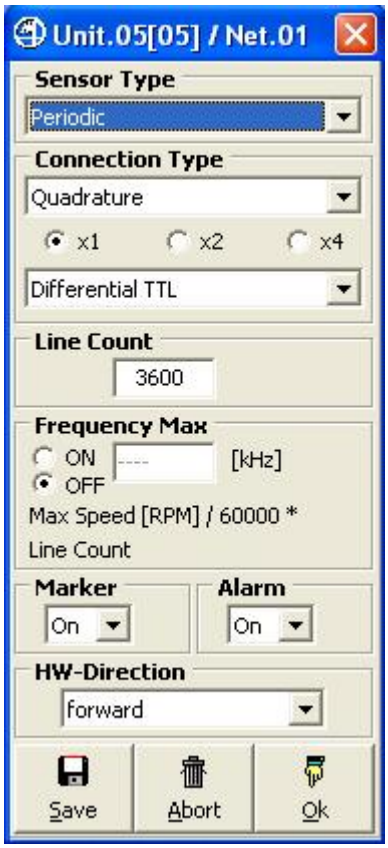


Figure 63: Digital Encoder Unit Periodic [degrees] Parameters Form

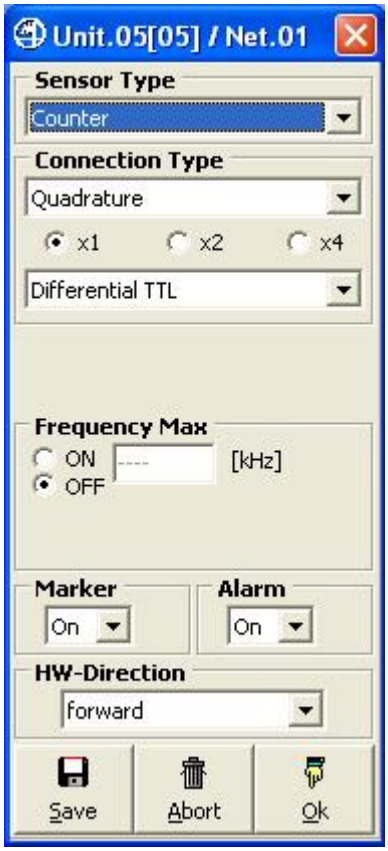


Figure 64: Digital Encoder Unit Counter Parameters Form

For the Analog unit there is showing few differences from the Digital :

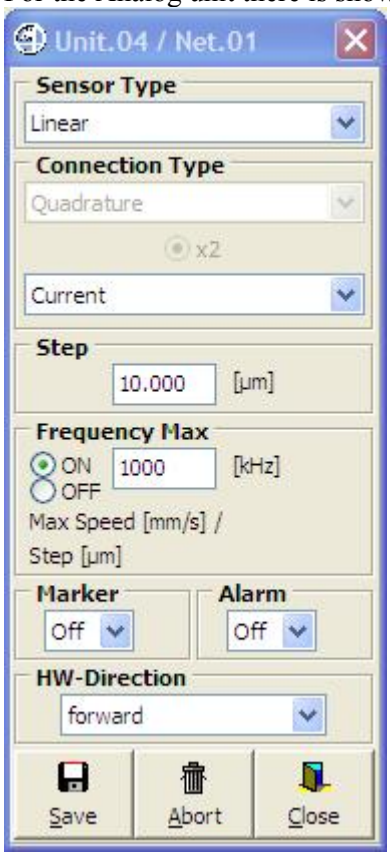
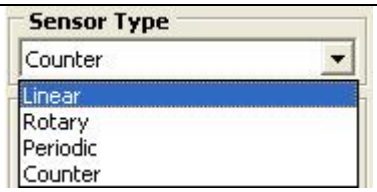
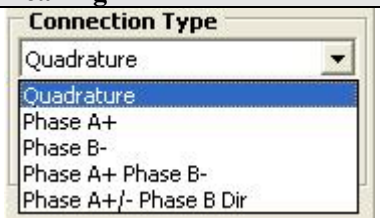
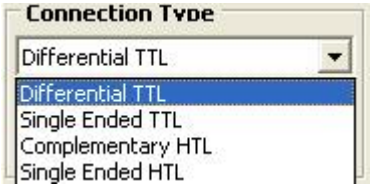


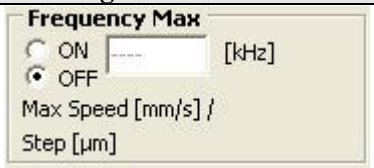
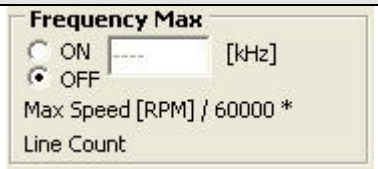
Figure 65b: Analog Encoder Unit Linear Parameters Form

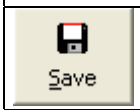
All parameters are described below for both Digital and Analog unit type. In the Analog type there is only one different parameter with different conditions and behaviour, the “Connection Type”:

Parameter	Meaning

Sensor Type	 **Linear** Signed measure [mm], based on **Step** parameter Applies to Linear Encoder and produces a measure with dimensional attribute, that can overflow. **Rotary** Signed angular measure [degrees], as ±360°*Round, based on **Line-Count** parameter. Applies to Rotary Encoder and produces a ±360°*Round measure with degree attribute, that can overflow. **Periodic** Signed angular measure [degrees], module(360°), based on **Line-Count** parameter. Applies to Rotary Encoder and produces a module(360°) measure with degree attribute, that never overflows. **Counter** Signed counting. Applies to Linear Encoder , Rotary Encoder or any kind of other Incremental Digital Devices, and produces a measure with no attribute, that can overflow.

Parameter	Meaning
Connection Type Digital Unit	 **Quadrature** Phase-A and Phase-B in quadrature **Phase A+** Phase-A only incrementing counting, Phase-B not cared **Phase B+** Phase-B only decrementing counting, Phase-A not cared **Phase A+ Phase B-** Phase-A incrementing counting, Phase-B decrementing counting **Phase A+/- Phase B Dir** Phase-A incrementing/decrementing counting function of Phase-B level  **x1** Division none **x2** Division half step **x4** Division quarter step  **Differential TTL** Differential signals with TTL levels **Single Ended TTL** Single Ended signals with TTL levels **Complementary HTL** Complementary signals with HTL levels **Single Ended HTL** Single Ended signals with HTL levels
Connection Type Analog Unit	 **Fixed Values for every Sensor Type** **Quadrature** Phase-A and Phase-B in quadrature **x2** Division half step  **Current** Current signal 11 µApp **Voltage** Voltage signal 1Vpp
Step **(Linear mode only)**	 Encoder **Step** [µm] , default 1 [µm] : measure resolution is self-adjusted by Unit elaborating this value
Line Count **(Rotary and Perioduc modes only)**	 Encoder **Impulses/Round** , default 3600 : measure resolution is self-adjusted by Unit elaborating this value

Parameter	Meaning
Frequency Max	  Encoder / Counter **Maximum Frequency** [kHz] , default disabled . Maximum Frequency of Input Signal parameter optionally specifies maximum operating frequency of Incremental Digital Encoder or other Incremental Digital Device : • Maximum Speed [mm/s] / Step [mm/1000] for Linear Encoder , metric system • Maximum Speed [inch/s] / Step [inch/1000] for Linear Encoder , imperial system • Maximum Speed [RPM] / 60000 * Step [Impulses/Round] for Rotary Encoder If enabled , Maximum Frequency of Input Signal parameter restricts allowed input frequencies : 1. on single Phase-A,B signals , transitions above programmed frequency are filtered 2. on both Phase-A,B signals , concurrent transitions above programmed frequency are detected and notified via < Over Speed > alarm . So Maximum Frequency of Input Signal parameter optionally let filter spikes on single phase and detect over-speed conditions .
Marker	**Marker** signal present. - ON Phase-M provided - OFF Phase-M not provided If Phase-M (Marker) is declared as present , test on its proper connection is enabled . If Phase-M (Marker) is declared as present , it will be used for Marker cycles in order to calibrate and apply zeroing to system .
Alarm	**Alarm** signal present. - ON Alarm provided - OFF Alarm not provided If Alarm is declared as present , test on its level is enabled : on error , alarm < Transducer Not Operative > is asserted .
HW-Direction	**Direction** of counting. - forward incrementing counting - backward decrementing counting

Ok , Save , Abort Buttons.	
	Closes window without saving changes.
	Saves changes to Unit parameters. All data are downloaded directly to Unit. All data are uploaded directly from Unit again
	Aborts changes to Unit parameters. All data are uploaded from Network Unit again.

6 Configuration and On-Line: “Complete” or “Simplified” Interface – Tabled Mode

When MDHQSPC Driver Programmer starts with an empty configuration loaded it shows a window like this:

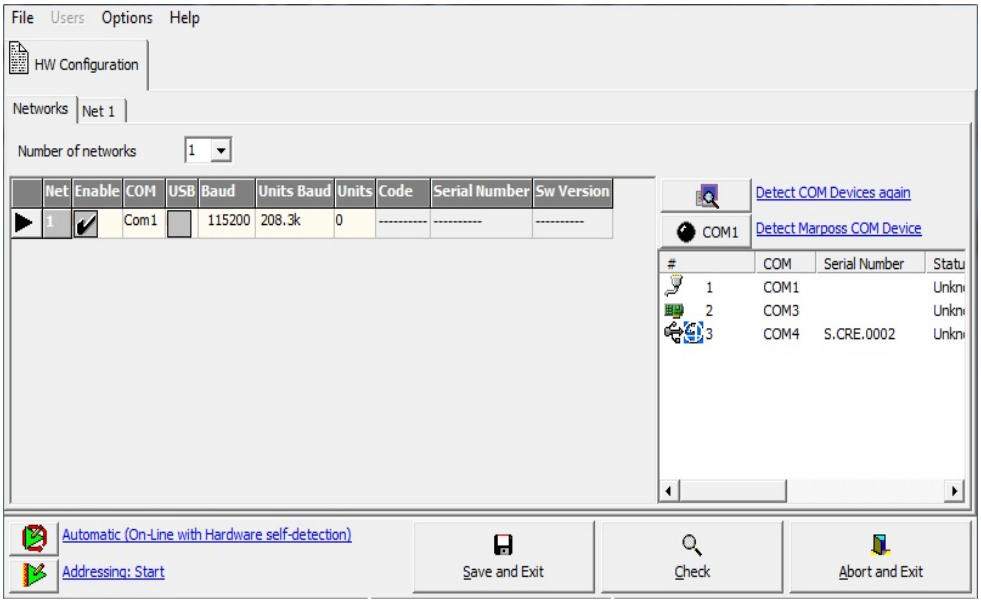


Figure 66: MDHQSPC Driver Programmer, simplified interface layout
(Example with empty configuration loaded)

Hardware configuration can be set up in two modes:

- **Automatic (On-line with Hardware self-detection)** - Hardware is automatically recognized and acquired without any intervention by the side of user.
- **Manual (Off-line)** - User designs hardware configuration adding manually nets and units.

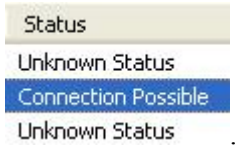
6.1 Automatic Configuration (On-line with Hardware self-detection)

This mode allows you to perform a complete hardware setup without any intervention by your side. A totally automatic procedure detect connected devices, acquire their parameters and perform an automatic addressing. After that you can save configuration and it is ready to use.

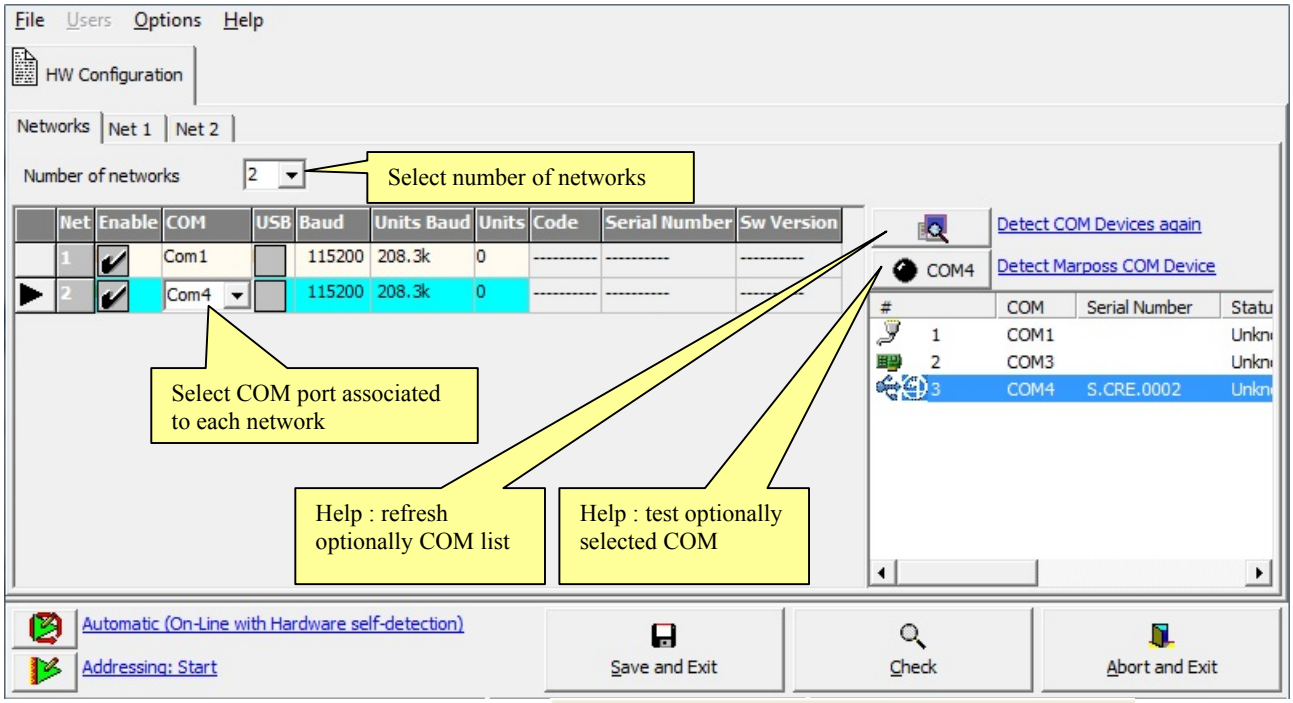
To perform an automatic configuration:

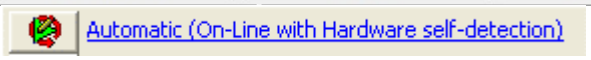
- select the number of nets present in the current configuration: 

- for each net, select the proper COM port. It is possible to test port and device connection by pressing the test button 

and reading the result in the Status column 

. There are many values to understand the status of the COM port: Unknow Staus, No Operative, Impossible to Connect and Connection Possible.



- press the Automatic configuration button: 

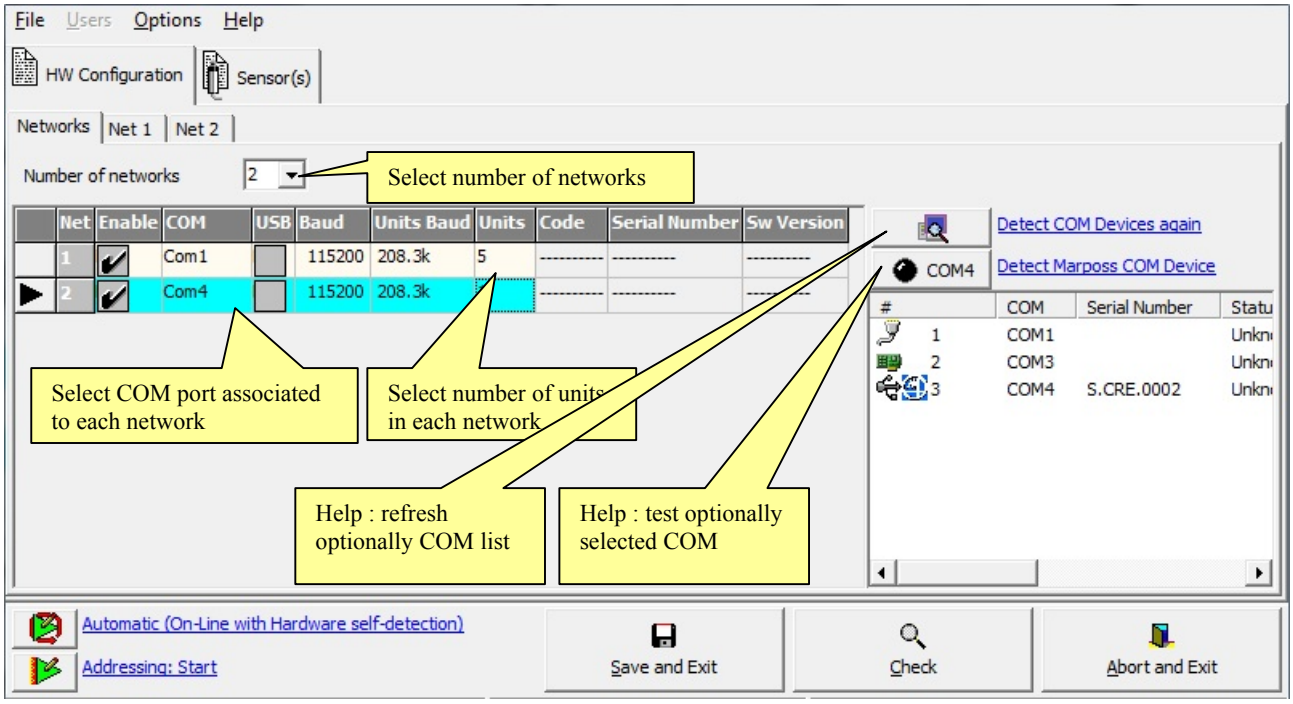
Only devices with **Protocol Version A3.0 or greater** can be detected.

Self detection could be a long time procedure (it depends on number of nets and units).
When self detection has been completed you can edit or save configuration.

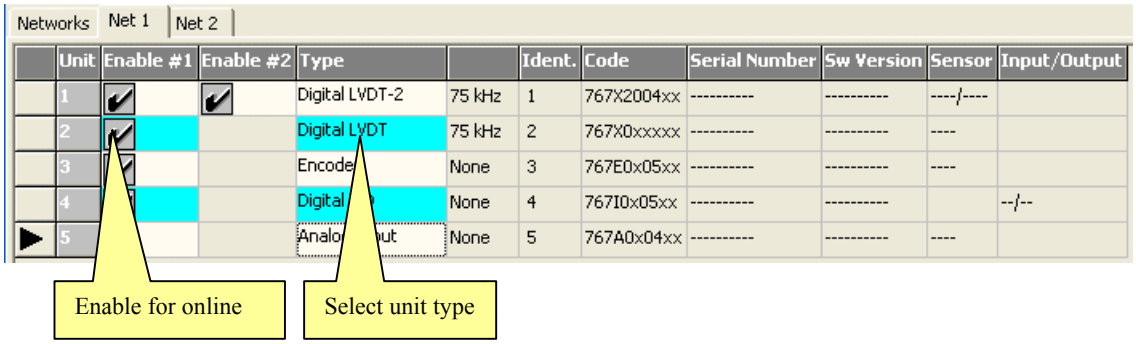
In any case:
- current hardware configuration is automatically self-detected;
- all current parameters of all detected devices are automatically self-loaded.

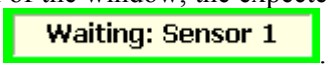
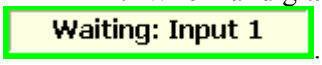
6.2 Manual configuration (Off-line)

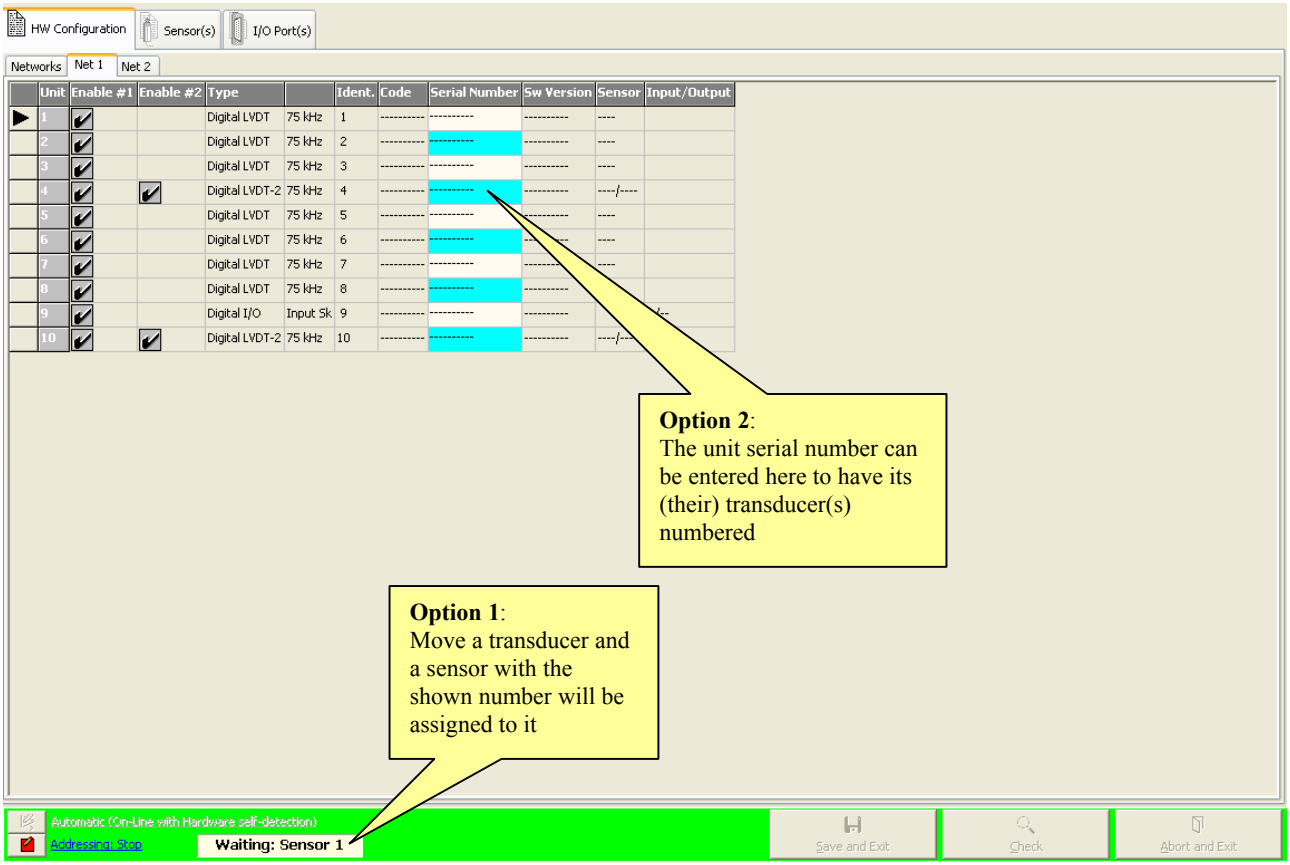
To perform a manual configuration:
- select the number of nets present in the current configuration:
- for each net, select the proper COM port.
- for each net, select the number of units connected.

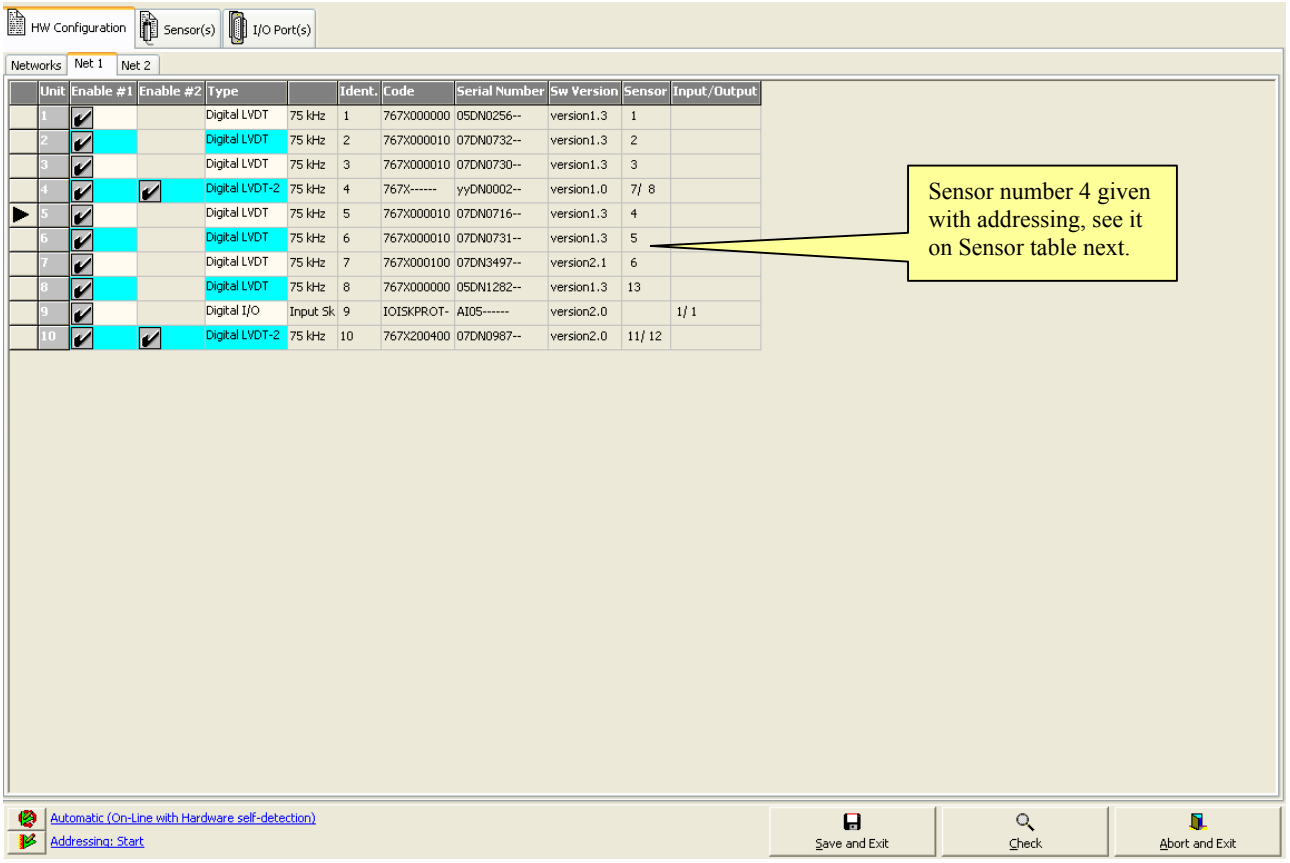


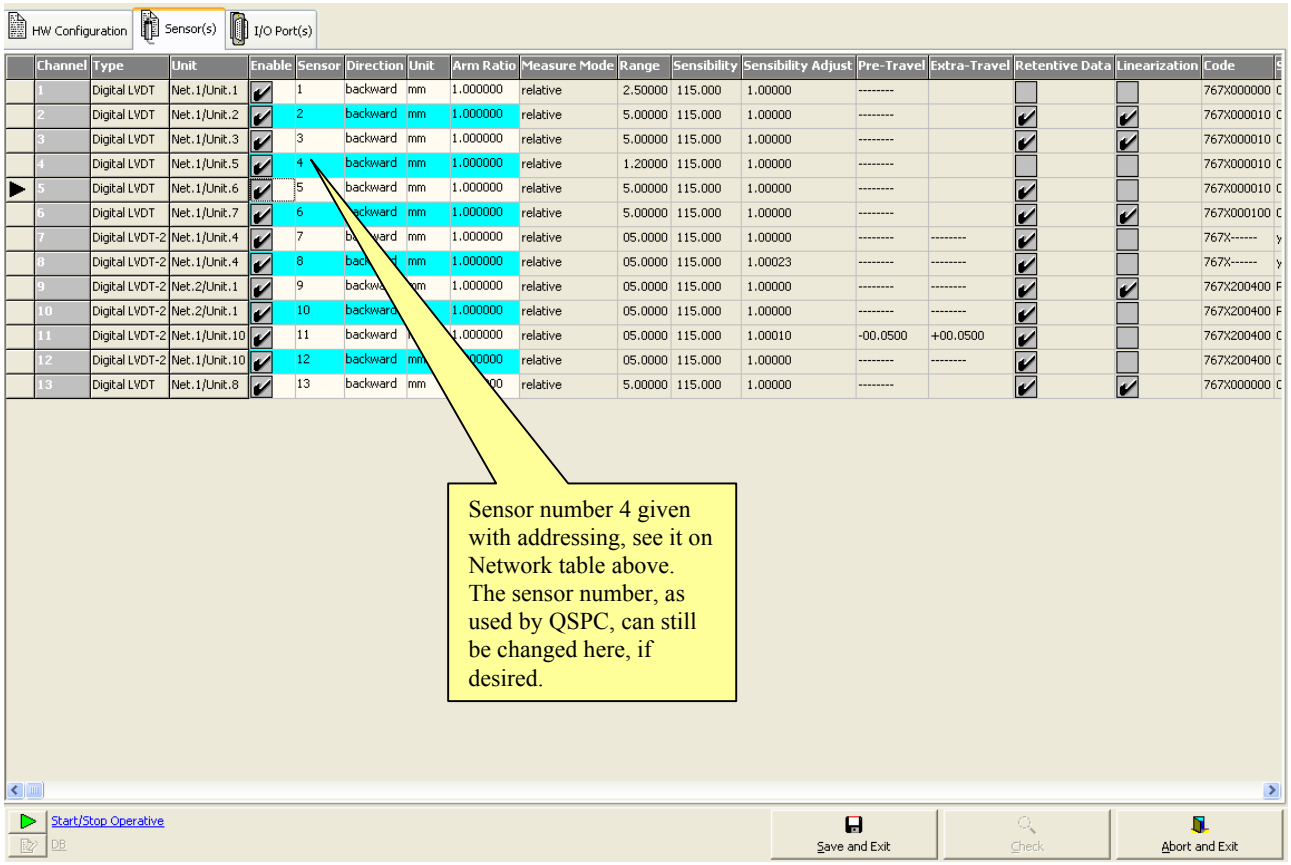
- for each net select the corresponding folder and select the unit types (default is Digital LVDT-2):



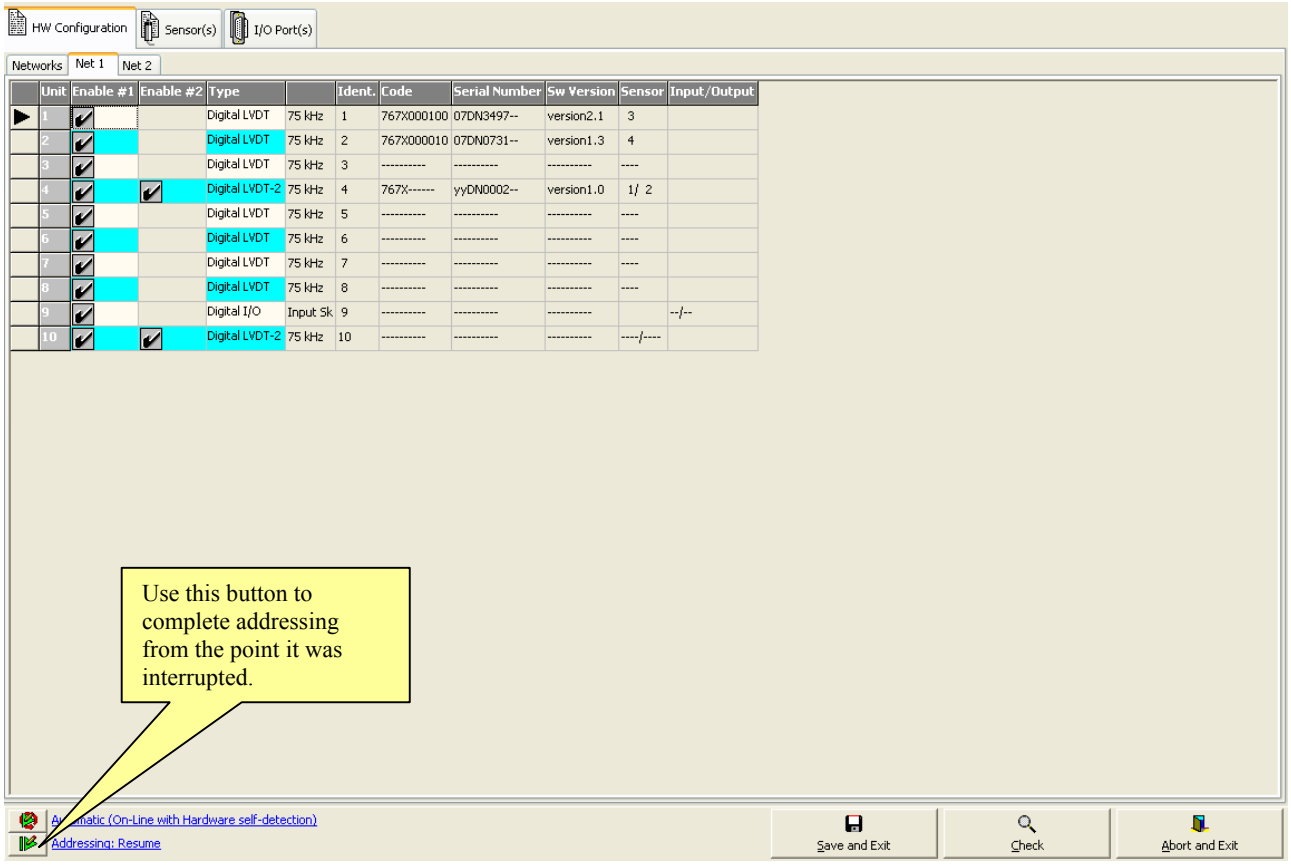
- press "Addressing: Start"  . This operation will set the communication IDs according to the unit number column, as chosen by the user. The starting window look like in the following page.
  On the bottom of the window, the expected sensor number (LVDT transducer, Analog Input or Encoder) is displayed:  . When a digital I/O is expected, "Input" number will be displayed in place of "Sensor":  .
  The green color on the bottom bar means that the driver is online, i.e. it is communicating with the network interface and units.
  Once addressing is complete, the "Sensor" and "Input/Output" columns are fully compiled. A new row is added to the  or  tables for each addressed sensor or I/O. See images on the next pages.


HW Configuration
Sensor(s)
I/O Port(s)
Networks
Net 1
Net 2
Unit
Enable #1
Enable #2
Type
Ident.
Code
Serial Number
Sw Version
Sensor
Input/Output
Option 2:
The unit serial number can be entered here to have its (their) transducer(s) numbered
Option 1:
Move a transducer and a sensor with the shown number will be assigned to it
Automatic (On-Line with Hardware self-detection)
Addressing: Stop
Waiting: Sensor 1
Save and Exit
Check
Abort and Exit

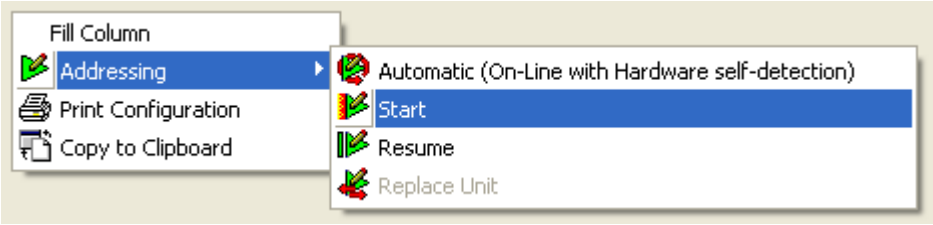

HW Configuration
Sensor(s)
I/O Port(s)
Networks
Net 1
Net 2
Unit
Enable #1
Enable #2
Type
Ident.
Code
Serial Number
Sw Version
Sensor
Input/Output
Sensor number 4 given with addressing, see it on Sensor table next.
Automatic (On-Line with Hardware self-detection)
Addressing: Start
Save and Exit
Check
Abort and Exit



If the “Stop” button is pressed before the Addressing Session is complete, it will be possible to finish it at a later time by pressing the “Resume” button. Note that a file with incomplete addressing can be saved.

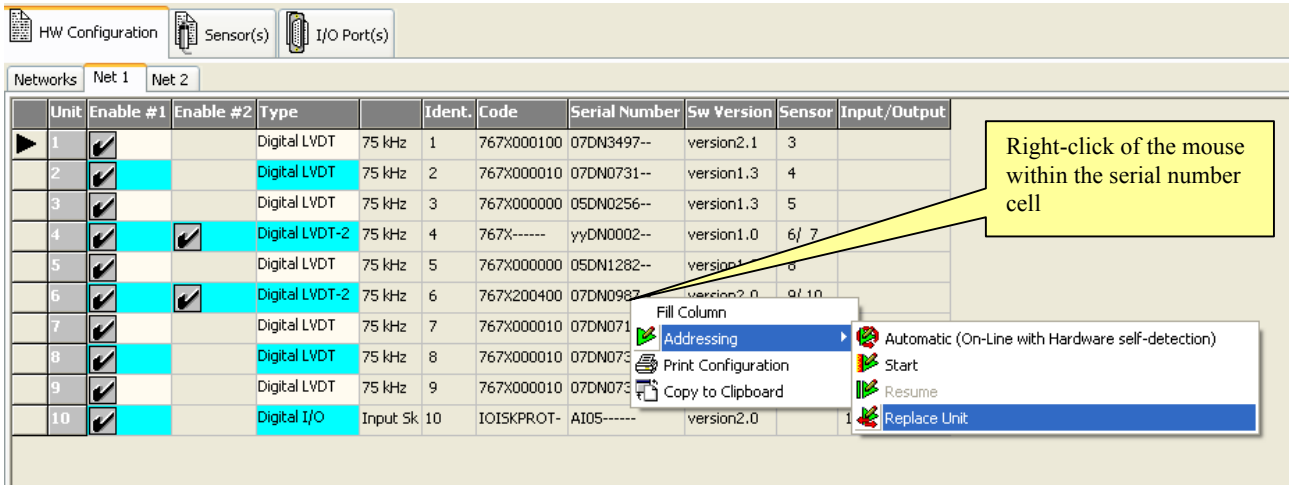


It is always possible to restart addressing from the beginning, cleaning all sensor and I/O numbers, by selecting “Addressing > Start” in the popup menu:

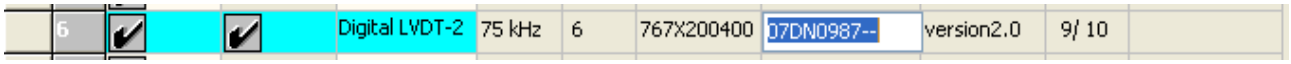


6.3 Replacing an unit

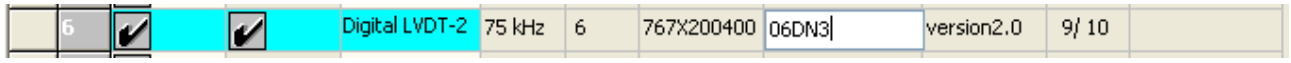
If you want to substitute a broken unit, or anyway replace it with another one, select “Replace Unit” in the popup menu, while the mouse is pointed over the “Serial Number” cell of the unit to be replaced:



Once “Replace Unit” is selected, the “Serial Number” cell will become editable:



Replace at the moment the physical unit in the network, before inserting the serial number of the new unit and confirming it with the “Enter” button:



6.4 Off-line configuration editing

Some parameters are set off-line and saved within the configuration file. See next subsections.

6.4.1 Sensor channel(s) Configuration Edit

This page allows to enable/disable a sensor channel and edit its configuration: you can edit only these parameters:

<table>
<tr><td>Enable</td><td colspan="4">Enable DigiBox related to sensor channel to go in OnLine mode</td></tr>
<tr><td>Sensor</td><td colspan="4">From 1 to 9999 (not yet assigned in current QSPC fixture)</td></tr>
<tr><td rowspan="2">Direction</td><td>LVDT
LVDT-2</td><td colspan="3">Backward/Forward</td></tr>
<tr><td>Incremental
Digital or Analog
Encoder</td><td colspan="3">Backward/Forward</td></tr>
<tr><td rowspan="3">Unit</td><td>LVDT
LVDT-2</td><td colspan="3">mm, deg, °C, gr</td></tr>
<tr><td>Analog Input</td><td colspan="3"><u>Voltage[V], Resistance[Ohm], Current[mA] modes</u>
mm, deg, °C, gr,
N, Pa, V ,mA ,Ohm, N*m, mm/s^2, Rad/s, Rad/s^2, dm^3/s</td></tr>
<tr><td>Incremental
Digital or Analog
Encoder</td><td><u>Linear mode</u>
mm, deg, °C, gr</td><td><u>Rotary/Periodic mode</u>
deg</td><td><u>Counter mode</u>
mm, deg, °C, gr,
N, Pa, V, mA,
Ohm, N*m,
mm/s^2, Rad/s,
Rad/s^2, dm^3/s</td></tr>
<tr><td rowspan="2">Arm Ratio</td><td>LVDT
LVDT-2</td><td colspan="3">From 0.5 to 4.0</td></tr>
<tr><td>Incremental
Digital or Analog
Encoder</td><td colspan="3">From 0.5 to 4.0</td></tr>
<tr><td>K Conv (1)</td><td>Analog Input</td><td colspan="3">Measure Conversion Factor</td></tr>
<tr><td rowspan="2">Offset (1)</td><td>Analog Input</td><td colspan="3">Measure Offset</td></tr>
<tr><td>Incremental
Digital or Analog
Encoder</td><td colspan="3">Measure Marker</td></tr>
<tr><td rowspan="5">Resistance Temperature Detector (1)</td><td rowspan="5">Analog Input</td><td colspan="3">RTD Enable</td></tr>
<tr><td colspan="3">R0 coefficient</td></tr>
<tr><td colspan="3">A coefficient</td></tr>
<tr><td colspan="3">B coefficient</td></tr>
<tr><td colspan="3">C coefficient</td></tr>
</table>

<u>Notes:</u>
(1): In case of Analog Input, the **Resistance Temperature Detector** parameters are used as an alternative to **K Conv / Offset** parameters, when on-line “Sensor Type” parameter is set to “Resistance”. In the latter case, “Unit” parameter can be set to something different from ““C” only if RTD is disabled.

See also the next figure:

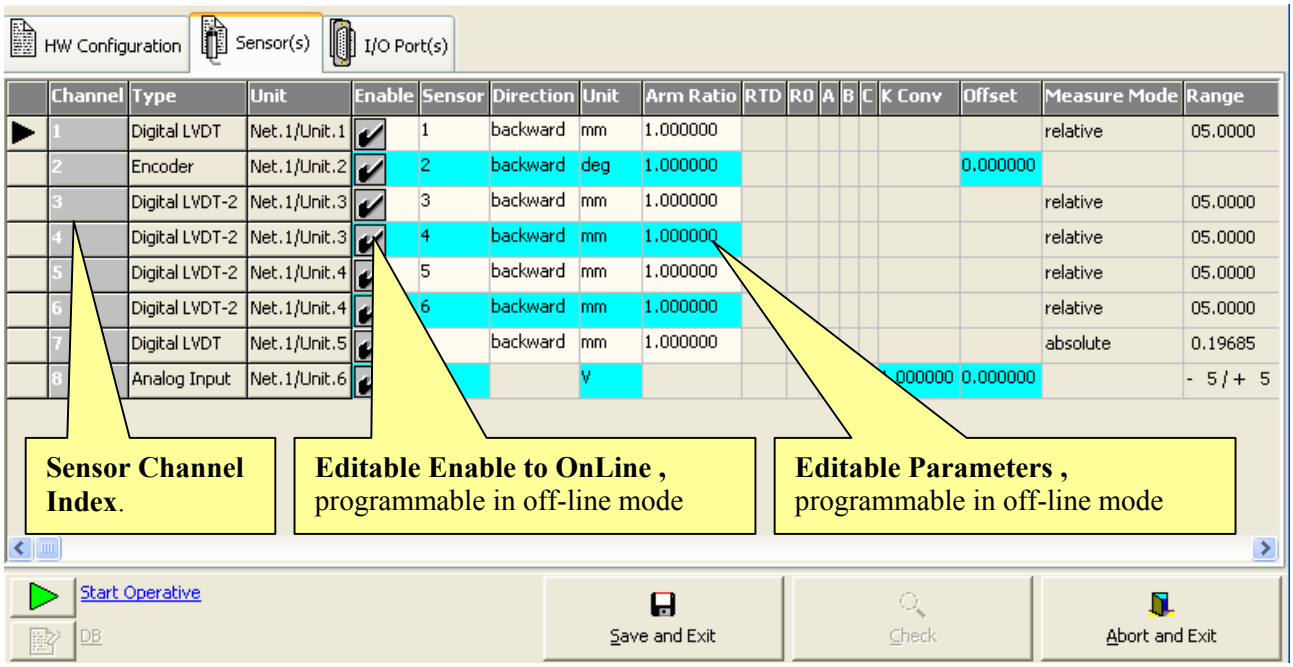


Figure 67: Sensor(s) configuration Edit

6.4.2 I/O port(s) configuration Edit

This page allows to enable/disable a Port channel:

Enable	Enable DigiBox related to Port to go in OnLine mode

See also this figure:

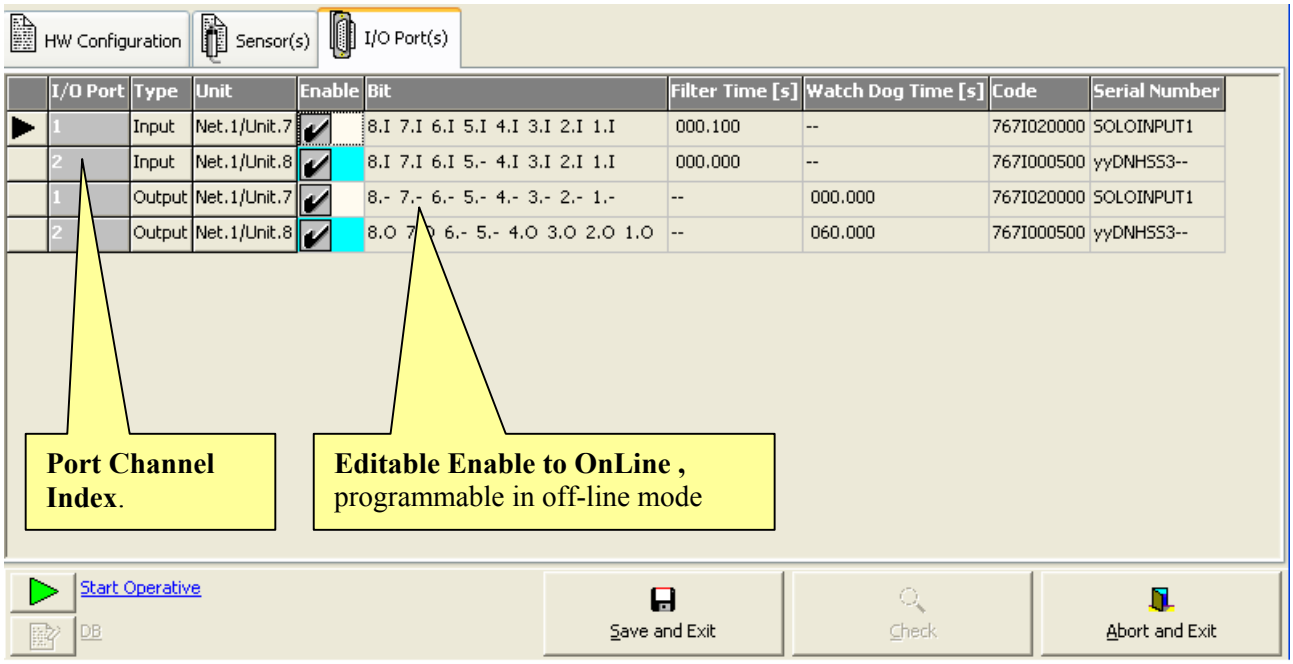


Figure 68: I/O channel(s) configuration Edit

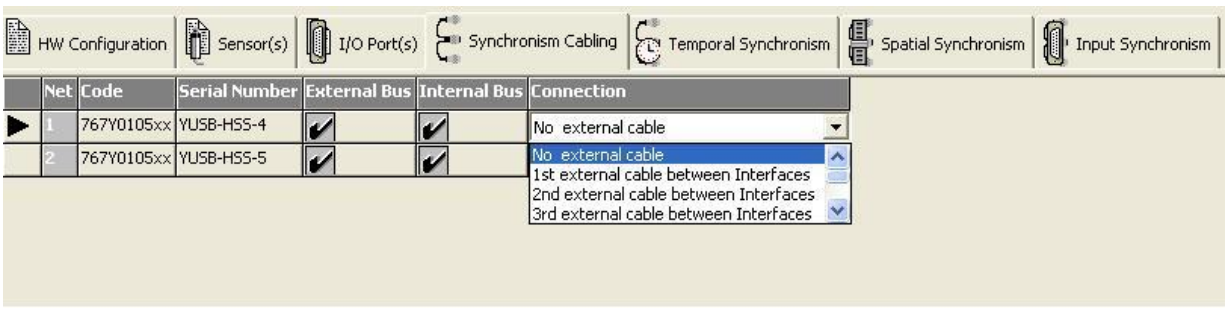
6.5 Synchronisms configuration

When hardware configuration is completed it is possible to configure synchronisms management. Three kinds of synchronisation are available: Temporal, Spatial and Input.

Depending on hardware capabilities of configured units and interfaces, four new folders may be available:

6.5.1 Synchronism cabling

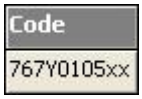
It is possible to link more nets together through a specific cable in order to have the same synchronism source for more networks (both temporal, spatial and input).
In this section it is possible to define the hardware connections between nets for synchronisms propagation.



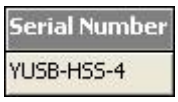
The following parameter are available:

Synchronism Cabling Parameters

Index of the selected Net (from #1 to #12).**(Read Only)**



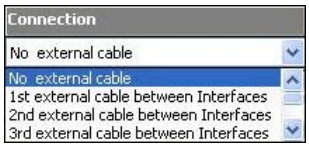
Product code of the interface in the net. It is self-acquired within addressing session **(Read Only)**



Serial number of the interface in the net. It is self-acquired within addressing session **(Read Only)**

This option is checked if the interface has the hardware capability to export synchronism to other networks through a specific output. It is self-acquired within addressing session **(Read Only)**

This option is checked if the interface has the hardware capability to generate temporal synchronism. It is self-acquired within addressing session **(Read Only)**

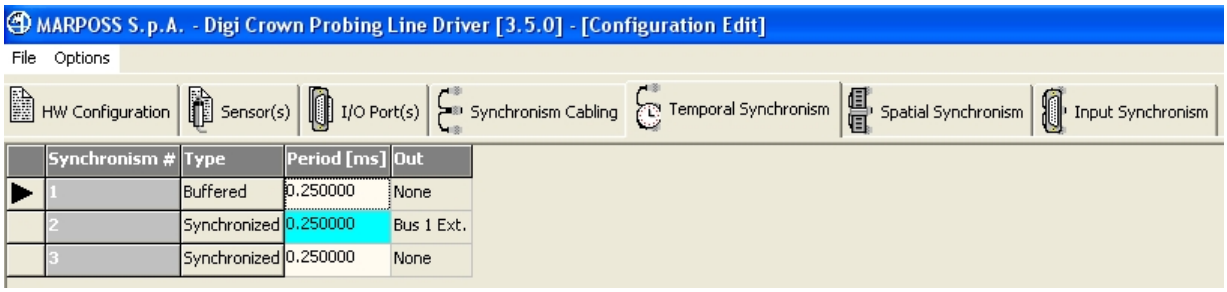


It is possible to select between six different external cabling (so it is possible to define up to six "synchronism" networks). If the net is not connected to others, "No External cable" option must be selected. If the net is connected to an external source of synchronism, "External cable from other device" option must be selected.

Note: this folder is visible only if at least one interface in the network does support synchronism. With old hardware interfaces or with interfaces that do not support "External Bus" capability, the "Connection" option will not be available.

6.5.2 Temporal Synchronism

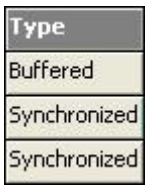
In this section it is possible to define the temporal synchronism period to be used as default.



The following parameter are available:

Temporal Synchronism Parameters

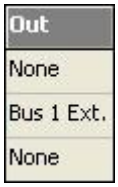
Index of temporal synchronism (from #1 to #3)**. (Read Only)**



Two different types of temporal synchronism are available **(Read Only)**:

1. **Buffered:** the synchronism is generated inside each single module. This is a low performance synchronisation, but is compatible with old hardware interfaces.
2. **Synchronized**: the synchronism source is the same for all units in the network. This is a high performance synchronisation but is available only with new hardware interfaces.

Temporal synchronism period to be used as default unless otherwise specified (default value is 0.25 ms).

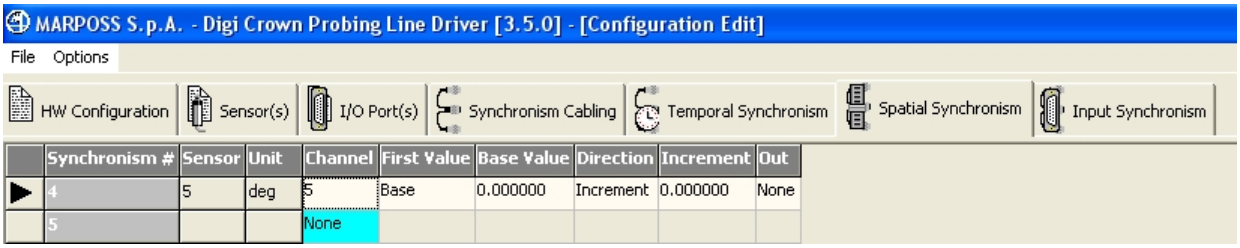


This parameter defines if the synchronism is propagated from one net to others. Synchronisms #1 and #3 do not propagate synchronism to other nets (out is set to "None"). Synchronism #2 does propagate synchronism to other nets (out is set to "Bus 1 Ext.") if a connection cable is present: the system automatically configures nets as "master" or as "slave". **(Read Only)**

Note: this folder is visible only if at least one interface in the network does support synchronisms #2 or #3.

6.5.3 Spatial Synchronism

In this section it is possible to configure all parameters used for a spatial synchronism management.



The following parametrs are available:

Spatial Synchronism Parameters

Index of spatial synchronism (from #4 to #28) **(Read Only)**

Sensor number used by QSPC of the unit Encoder selected for spatial synchronism generation. **(Read Only)**

Measure unit of the unit Encoder selected for spatial synchronism generation. **(Read Only)**

Select the channel index of the Encoder unit for spatial synchronism generation. In the list will be proposed only Encoders with synchronism generation capability.

Four different modes for spatial synchronism generation are available:

- **Base:** 1st synchronisation event is produced if counter/position value reaches programmed absolute counter/position value
- **Current:** 1st synchronisation event is produced if counter/position value reaches current counter/position plus programmed offset value
- **First Multiple:** 1st synchronisation event is produced if counter/position value reaches programmed absolute counter/position value or its multiple
- **Marker:** 1st synchronisation event is produced if Marker signal is detected and than counter/position value reaches programmed offset value

Offset/Absolute value used for the 1st synchronisation event triggering.

Direction of period/increment for synchronisation event triggering.

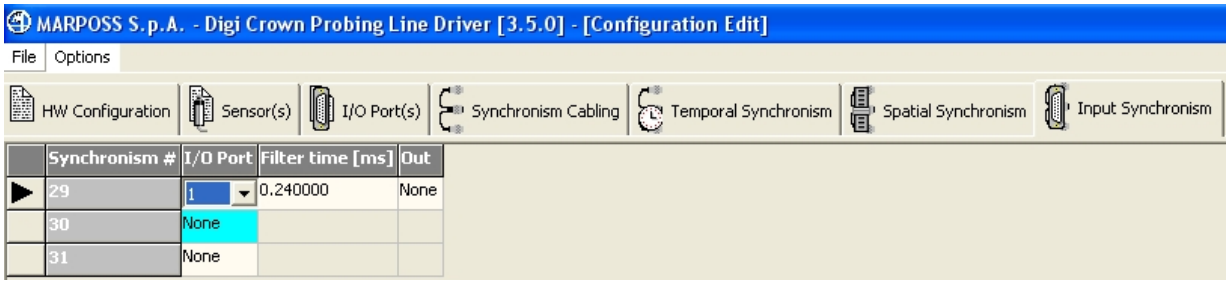
Period/Increment value used for synchronisation event triggering after 1st one, programming the amount of required period/increment between events.

If synchronism must be propagated to other nets then set out to “Bus 1 Ext.” or “None” otherwise.

Note: this folder is visible only if at least one Encoder with synchronism generation capability is present in one of the networks.

6.5.4 Input Synchornism

In this section it is possible to configure all parameters used for Input Synchronism management.



The following parametrs are available:

Input Synchronism Parameters

Index of input synchronism (from #29 to #31) **(Read Only)**

Input/Output port number of the unit selected for input synchronism generation. In the list will be proposed only modules with synchronism generation capability.

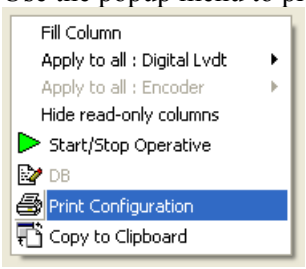
Length of the filter time to avoid glitches on generated synchronism signal.

If synchronism must be propagated to other nets then set Out to “Bus 1 Ext.” or “None” otherwise

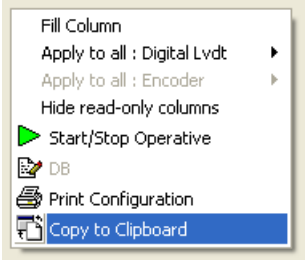
Note: this folder is visible only if at least one I/O module with synchronism generation capability is present in one of the networks.

6.6 Print/Copy configuration

Use the popup menu to print configuration or copy it to clipboard.



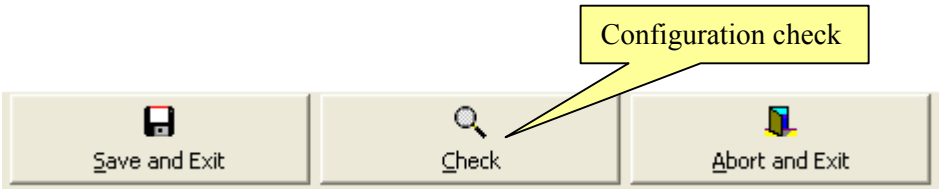
Format and print data.
An error occurs if you don’t have any printer installed.



Copy data to clipboard.
Data can be pasted into another application (for example a text editor).

6.7 Check Configuration

The button signaled below perform an integrity data check on the current configuration. This is an off-line check (no communication with network).



Check results are showed into an external report panel that lists errors for each net and unit.

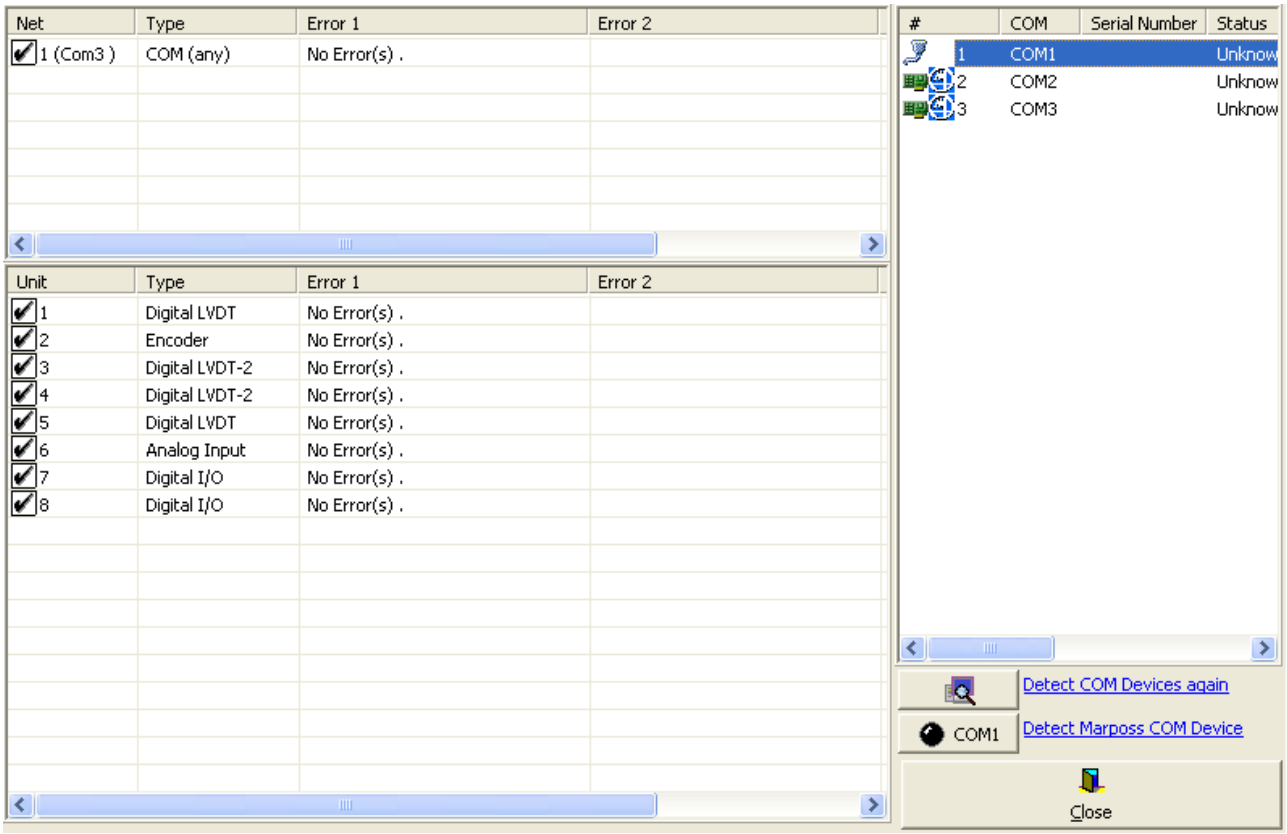
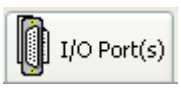


Figure 69: Configuration Check Form

6.8 Operative On-Line Session

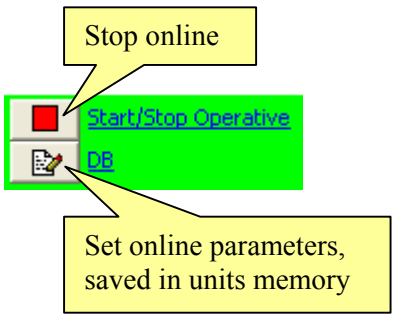
At the bottom of the 

or 

tables, once addressing has been completed, this button will be enabled:

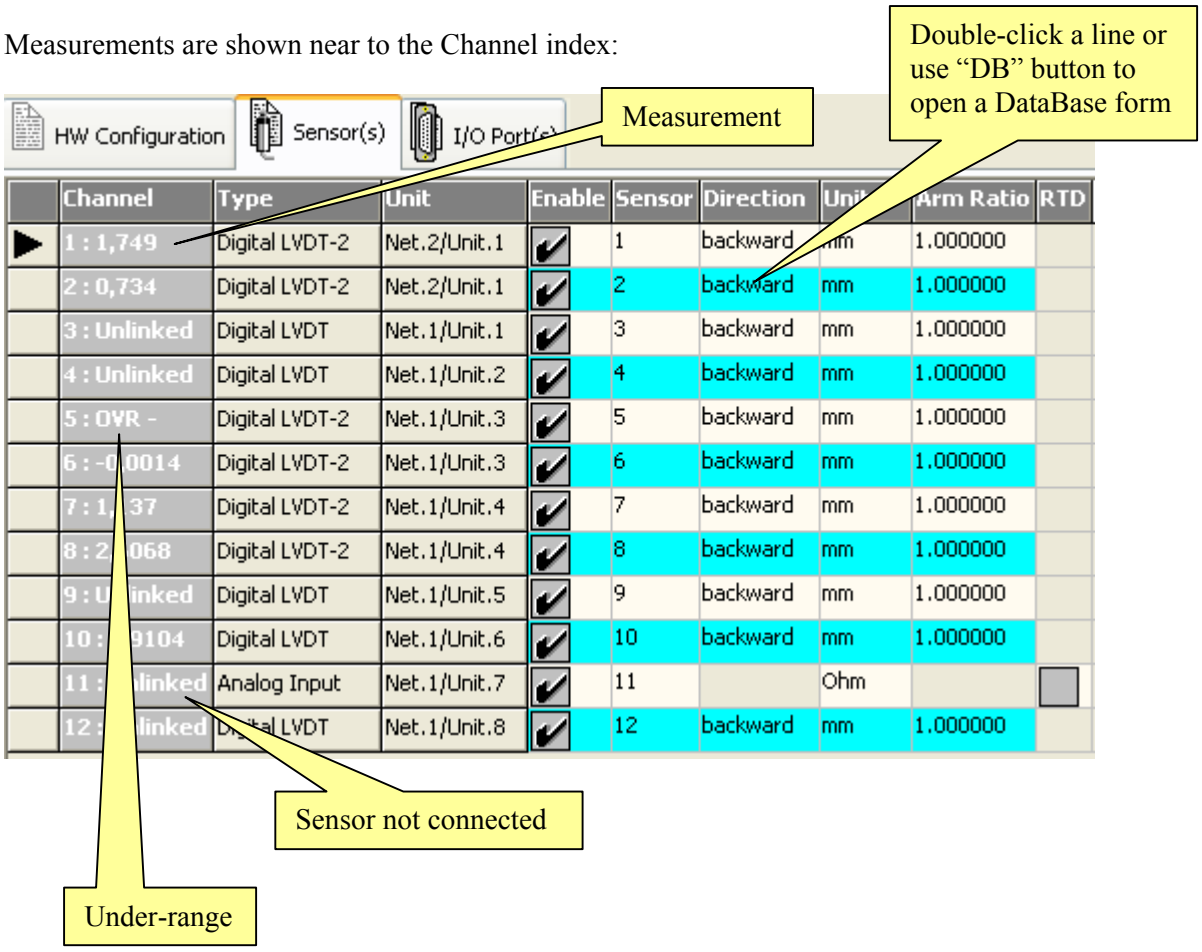
That button starts the **Operative session**.
Operative session let user check proper on-line capability of network(s) and to have diagnosis information, including measurements. Operative session let user program parameters that specialize unit behaviour.

While online, the bottom bar has a green background:



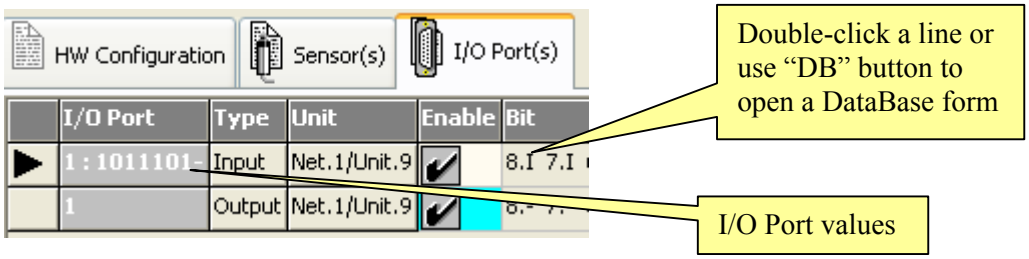
While online, the "DB" button opens a DataBase window to set specialized unit parameters directly into the units. These DataBase windows (different for each unit type) and corresponding parameters are described in section 5.7. "DB" button opens a window referenced by the black arrow on the leftmost column.

Measurements are shown near to the Channel index:



	Channel	Type	Unit	Enable	Sensor	Direction	Unit	Arm Ratio	RTD
▶	1 : 1,749	Digital LVDT-2	Net.2/Unit.1	✔	1	backward	mm	1.000000	
	2 : 0,734	Digital LVDT-2	Net.2/Unit.1	✔	2	backward	mm	1.000000	
	3 : Unlinked	Digital LVDT	Net.1/Unit.1	✔	3	backward	mm	1.000000	
	4 : Unlinked	Digital LVDT	Net.1/Unit.2	✔	4	backward	mm	1.000000	
	5 : OVR -	Digital LVDT-2	Net.1/Unit.3	✔	5	backward	mm	1.000000	
	6 : -0,0014	Digital LVDT-2	Net.1/Unit.3	✔	6	backward	mm	1.000000	
	7 : 1,4137	Digital LVDT-2	Net.1/Unit.4	✔	7	backward	mm	1.000000	
	8 : 2,4068	Digital LVDT-2	Net.1/Unit.4	✔	8	backward	mm	1.000000	
	9 : Unlinked	Digital LVDT	Net.1/Unit.5	✔	9	backward	mm	1.000000	
	10 : 9104	Digital LVDT	Net.1/Unit.6	✔	10	backward	mm	1.000000	
	11 : Unlinked	Analog Input	Net.1/Unit.7	✔	11		Ohm		
	12 : Unlinked	Digital LVDT	Net.1/Unit.8	✔	12	backward	mm	1.000000	

I/O values are shown near to the I/O port indexes:



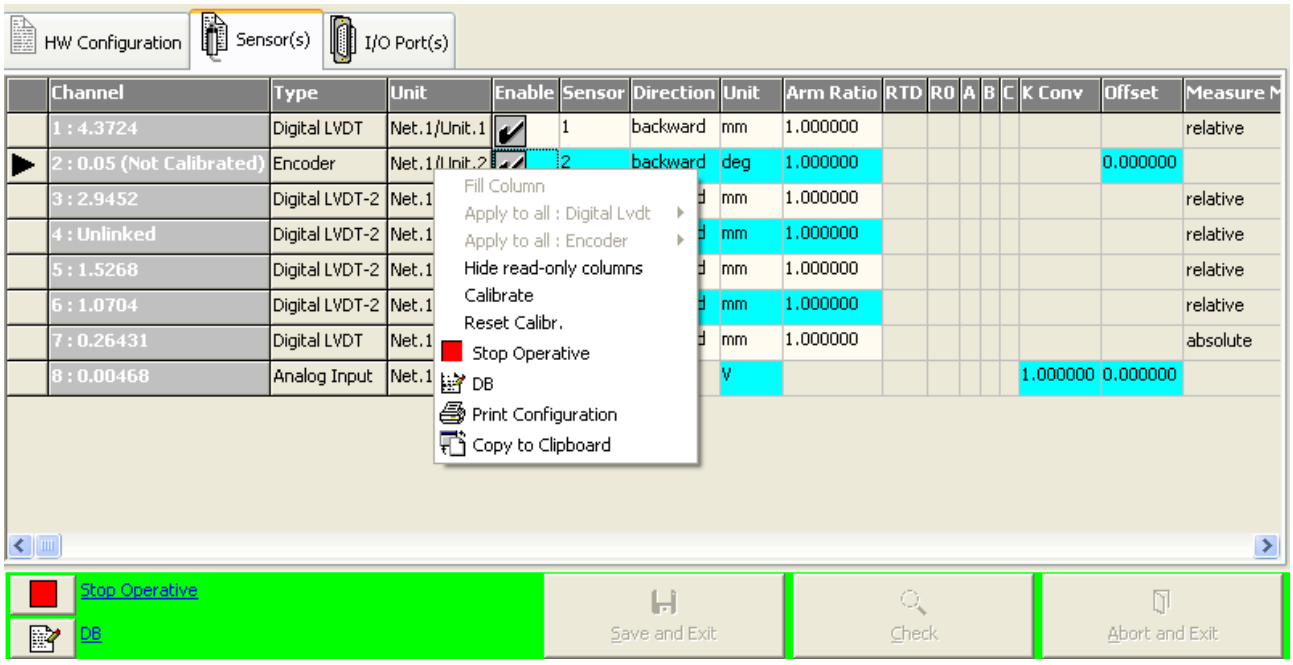
Online DataBase parameter changes are reflected in the gray cells of the "Sensors" or "I/O Ports" tables. Offline parameters (white and blue cells) cannot be modified while online.

Besides readings, the "Channel" or "I/O port" can show the following messages:

Unlinked	Transducer not connected
OVR +	Measurement over-range
OVR -	Measurement under-range
HW Error	Hardware error
Not Calibrated	Calibration not performed (for Encoders)
Calibrating…	Calibration cycle is pending (for Encoders)
----	Could not communicate or measurement not yet available

6.8.1 Encoder Calibration

When an operative On-Line session is running, it is possible to perform a calibration/uncalibration of Encoder modules.

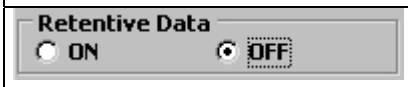


To perform a calibration (or reset the calibration status), just select the row corresponding to the Encoder module that must be calibrated/uncalibrated, press the right mouse button and select the command inside the popoup menu.

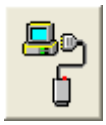
7 APPENDIX

7.1 Keyboard use

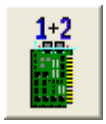
ALT	Activates Menu: use pointers to navigate menu items
CTRL + F6	Activates a Form (Net or Unit Form) inside the main window: only one Form can be active at the same time
CRTL + pointers	Moves the active Form inside the main window
ALT+ pointers	Moves unit cursor on the active Net Form ALT+ UP Moves unit cursor on a the first location ALT+ RIGHT Moves unit cursor on a the next location ALT+ LEFT Moves unit cursor on a the previous location
ALT+ CR	Open Unit Form on the current location
ALT+ X	Toggles between enabled/disabled state on Net or Unit Form

TAB	Use TAB to select a control into a Form. Only enabled controls cane be selected
	Buttons use Button by selection or keyboard shortcut: by selection: select it by TAB and then Press CR by shortcut : ALT + *underlined character on it's caption* (ALT+S in the example)
	Text box Write into
	List box Use pointers (up/down) to select the list item or write into (if possible)
	Options box Use pointers to select option

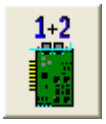
7.2 Drivers for WIN32 platforms

7.2.1  Interface RS232 .

Interface Station supports the RS232 serial communication driver with host via COM Port .
No additional driver is required .
Support : Support Manual for DigiCrown Probing Line 232/USB : document D4340032GF.pdf
http://www.marposs.com/ftp/library/D4340032GF.pdf

7.2.2  Interface (2 ports) Board ISA .

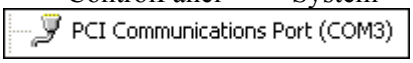
Interface Station supports the serial communication driver with host via COM Port .
Interface Station supplies all units on RS485 bus with 7.5V .
System BIOS must be adjusted in order to properly install COM Ports: assigned COM Port can be selected as required.
No additional driver is required .
Support : Support Manual for DigiCrown Probing Line ISA : document D4340034GF.pdf
http://www.marposs.com/ftp/library/D4340034GF.pdf

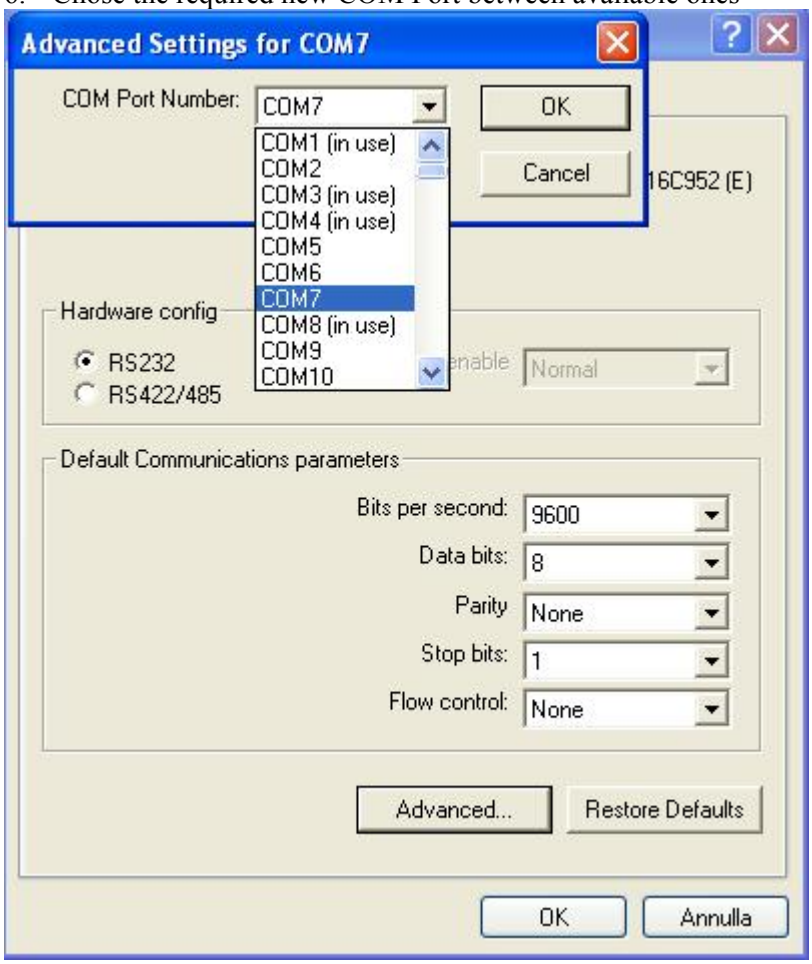
7.2.3  Interface (2 ports) Board PCI .

Interface Station supports the serial communication driver with host via COM Port .
Interface Station supplies all units on RS485 bus with 7.5V .
Driver Package is self-installed : please, install PCI board only if Driver Package was just properly self-installed .
*Driver Package includes **OXSER.INF** file .*
Following proprietary drivers are used :

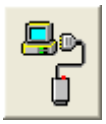
- ***OXSER.SYS*** *version 4.09*

Assigned COM Port can be changed if required .

1.  → "Settings" → "ControlPanel" → "System" → "Hardware" → "Device Manager"
2. Select proper COM Port 
3. Select "Property" option with right mouse click
4. Select "Settings" folder
5. Press "Advanced" button
6. Chose the required new COM Port between available ones



Support : Support Manual for DigiCrown Probing Line PCI : document D4340035GF.pdf
http://www.marposs.com/ftp/library/D4340035GF.pdf

7.2.4  Interface FullSpeed USB [12Mbps] .

Interface Station supports the serial communication driver with host via Virtual COM Port .

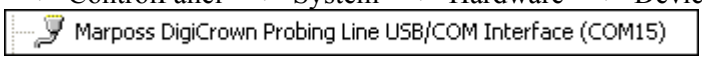
The connection of a FullSpeed USB Interface device reserves a COM port permanently in the system .
Driver Package is self-installed : please, connect USB device only if Driver Package was just properly self-installed .
Following proprietary drivers are used :

- ***SLABBUS.SYS*** *version 4.40*
- ***SLABSER.SYS*** *version 4.40*

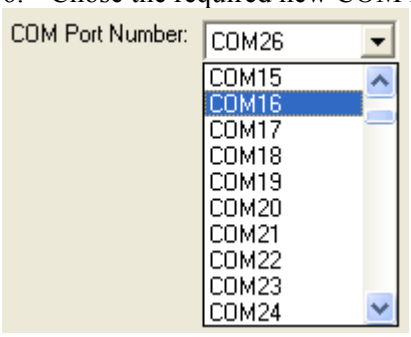
Driver Package can be checked or uninstalled in Control Panel -> Application Installation as "MARPOSS USB/COM Interface" .
If Driver Package is uninstalled , all COM Ports that were reserved because some previous Interface connections will be released and return free for the system .

Assigned COM Port can be changed if required .

1. 

→ "Settings" → "ControlPanel" → "System" → "Hardware" → "Device Manager"
2. Select proper COM Port 

3. Select "Property" option with right mouse click
4. Select "Settings" folder
5. Press "Advanced" button
6. Chose the required new COM Port between available ones



Support : *Support Manual for DigiCrown Probing Line 232/USB : document D4340032GF.pdf*
http://www.marposs.com/ftp/library/D4340032GF.pdf

7.2.5  Interface HighSpeed / FullSpeed USB [480Mbps / 12Mbps].

Interface Station supports the serial communication driver with host via Virtual COM Port .
The connection of a HighSpeed/FullSpeed USB Interface device reserves a COM port permanently in the system .
Driver Package is self-installed : please, connect USB device only if Driver Package was just properly self-installed .
Standard Windows drivers are used :

- ***SERENUM.SYS***
- ***USBSER.SYS***
- ***USBEHCI.SYS*** ***version ≥ 5.1.2600.2783*** *for optimal working ([1])*
- ***USBPORT.SYS*** ***version ≥ 5.1.2600.2783*** *for optimal working ([1])*

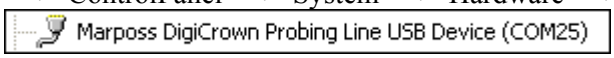
Driver Package can be checked or uninstalled in Control Panel -> Application Installation as "MARPOSS S.pA. USB DigiCrown Probing Line port (09/23/2008 1.00.0)" .
If Driver Package is uninstalled , all COM Ports that were reserved because some previous Interface connections will be released and return free for the system .

([1]) Information Note .
Is know a problem when connecting a device to a USB 2.0 hub in Microsoft Windows XP , only if system file USBEHCI.SYS and USBEHCI.SYS have version minor than 5.1.2600.2783 .
Symptoms :
USB device may stop working .
Cause :
High traffic on USB 2.0 hub when low-speed or full-speed USB device are in use or connected/disconnected .
Related file information :

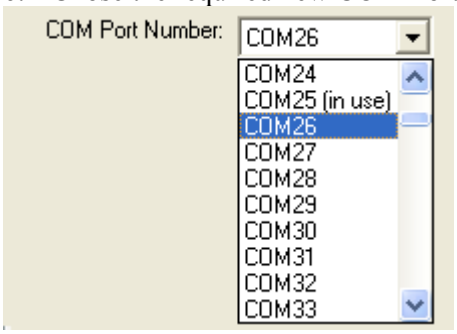
- *USBEHCI.SYS* *version < 5.1.2600.2783*
- *USBPORT.SYS* *version < 5.1.2600.2783*

Support :
http://support.microsoft.com/kb/908673-en-us

Assigned COM Port can be changed if required .

1.  → "Settings" → "ControlPanel" → "System" → "Hardware" → "Device Manager"
2. Select proper COM Port 

3. Select "Property" option with right mouse click
4. Select "Settings" folder
5. Press "Advanced" button
6. Chose the required new COM Port between available ones



Support : Support Manual for DigiCrown Probing Line 232/USB : document D4340032GF.pdf
http://www.marposs.com/ftp/library/D4340032GF.pdf

8 NOTE

For a full list of address locations, please consult the Marposs official website: www.marposs.com

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Marposs has an integrated system to manage the Company quality, the environment and safety, attested by ISO 9001, ISO 14001, OHSAS 18001 and QS9000 T&E certifications. Marposs has further been qualified EAQF 94 and has obtained the Q1-Award.