KLAY-INSTRUMENTS

INSTRUCTION MANUAL

DTM - HART
SERIES 4000, 4000-SAN,
DP-4000 and TT-4000

FDT GROUP
Affiliate Class 3 Member

For optimal use read the recommendations and warnings in this manual, these instructions should be studied carefully.

Manufactured by:

KLAY-INSTRUMENTS B.V.
www.klay-instruments.com

Nijverheidsweg 5
7991 CZ DWINGELOO
The Netherlands

Tel: 0521-591550
E-Mail: info@klay.nl

1. INTRODUCTION

This instruction manual is a guide for installing and using the intelligent pressure and level transmitter Series 4000, 4000-SAN, DP-4000 and TT-4000, HART DTM. This DTM is developed to make configuration changes of the Series 4000 transmitters easy. This DTM can be used with almost every FDT-container.

2. INSTALLATION

To install the Klay DTM Series 4000 on your system, you have to download the installation file. This file can be downloaded from the Klay Instruments website: www.klay.nl under section downloads.

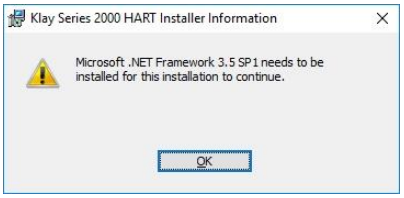
To start the installation always extract ***Klay Series 4000 HART_1.0.2.zip***.
Select ***Klay Series 4000 HART.exe*** * (You must have administrator rights, do not use the .msi file)

**Minimal software requirements: Windows 7 (32 or 64 bit) or higher, for older versions please contact Klay Instruments.*

2.1 Microsoft .net Framework 3.5

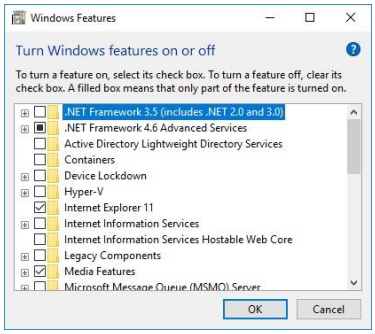
The Klay DTM requires .NET Framework 3.5 from Microsoft.
If the framework is already installed the setup will continue.

When the framework is not installed the following message appear:



Windows 7 users can download the .NET Framework package from the following location: https://www.microsoft.com/nl-nl/download/details.aspx?id=21

Windows 10 and 8 users can enable the .NET Framework by selecting the start menu and type windows features in the search box.
The following window appears and the .NET Framework 3.5 can be enabled.

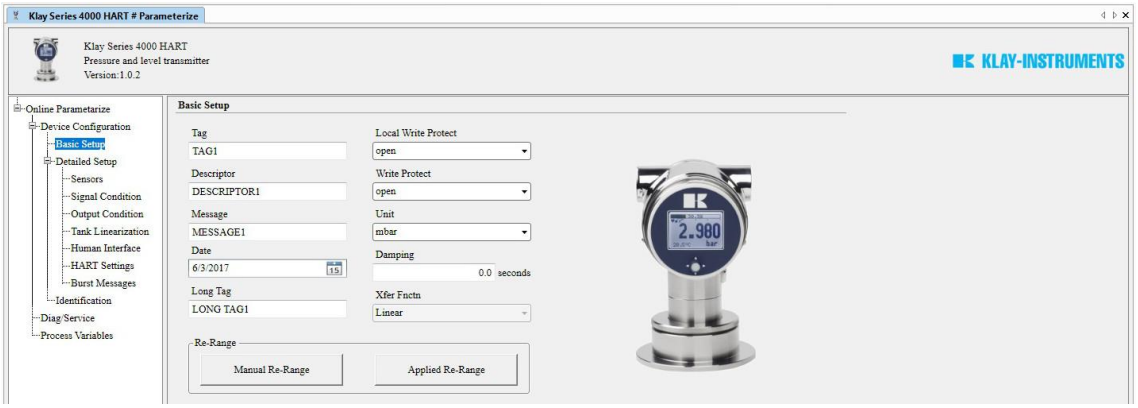


3 DTM

The following pages describes the DTM configuration.

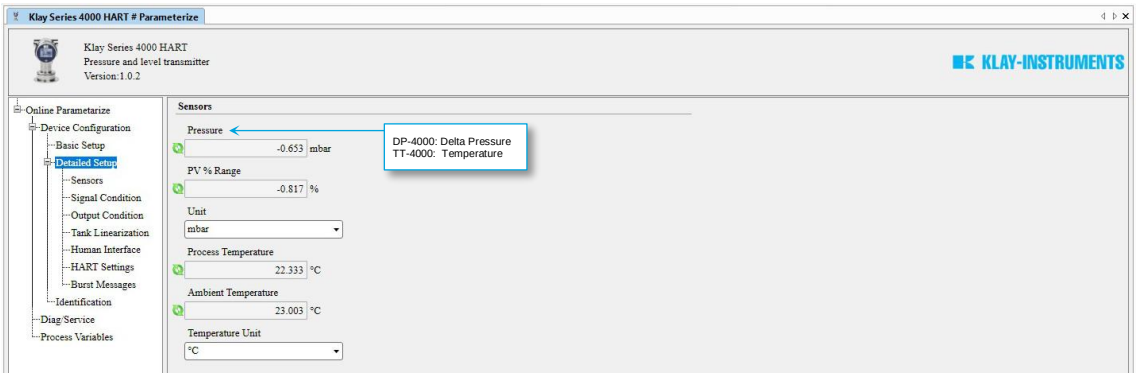
3.1 BASIC SETUP

In this menu basic data of the transmitter can configured. Information like Tag Number, Descriptor and others can be entered in the text fields. In this menu it is possible to change the span (LRV and URV) of the transmitter without test pressure with the option **Manual Re-Range**, follow the displayed instructions. With the option **Applied Re-Range** the span can be changed with a test pressure, follow the displayed instructions. The mounting position effect of the transmitter can be neutralized with the option **Set Mounting Correction** or reset to factory default with the option **Reset Mounting Correction**. Damping can be adjusted between 0 and 25 seconds. With the option **Local Write Protect**, protection against local adjustment on the transmitter can be set. With the option **Write Protect**, protection against adjustment by HART® can be set. The engineering unit of the pressure and temperature can be changed in this menu.



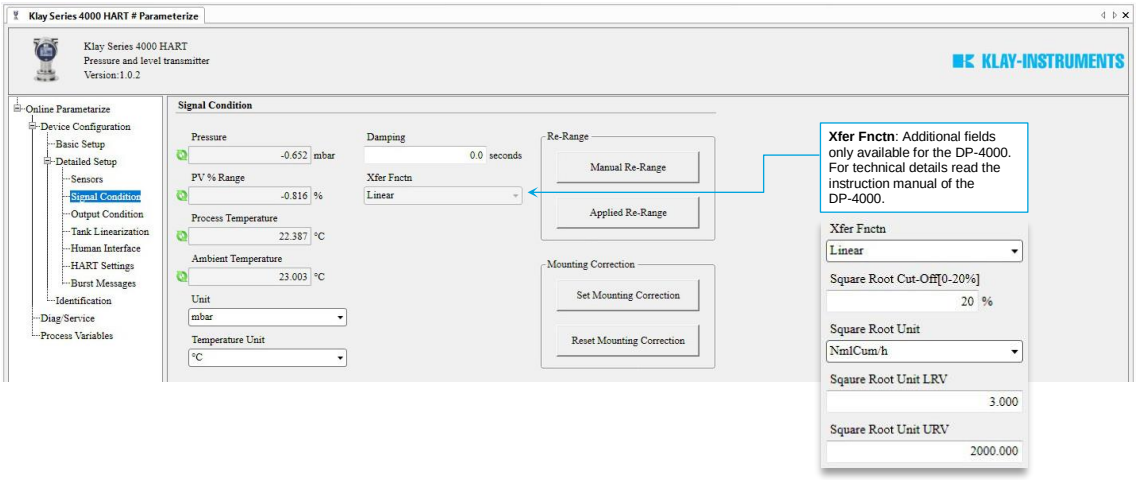
3.2 DETAILED SETUP

This menu contains data like the actual pressure, sensor and ambient temperature, these values are refreshed every 10 seconds. The engineering unit of the pressure and temperature can be changed.



3.3 SIGNAL CONDITION

This menu contains data like the actual pressure, sensor and ambient temperature. These values are refreshed every 10 seconds. The engineering unit of the pressure and temperature can be changed.
In this menu it is also possible to change the span (LRV and URV) of the transmitter without test pressure with the option **Manual Re-Range**, follow the displayed instructions. With the option **Applied Re-Range** the span can be changed with a test pressure, follow the displayed instructions. The mounting position effect of the transmitter can be neutralized with the option **Set Mounting Correction** or reset to factory default with the option **Reset Mounting Correction**. Damping can be adjusted between 0 and 25 seconds.



3.4 OUTPUT CONDITION

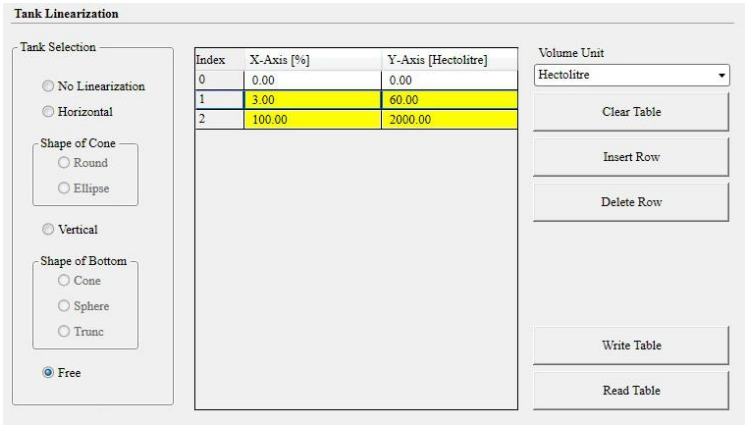
This menu contains the actual loop current of the transmitter. With the option **Alarm Output** two fail safe options are available. The option **High** creates a output of 22.8 mA and the option **Low** creates a output of 3.8 mA in case of a failure. The output of the transmitter can be configured into **4-20 mA** or **20-4 mA**. With the option **Loop Simulation** a current can be simulated. Three options are available: **4 mA, 20 mA** and **Other**. With **Other** a manual value between 4 and 20 can be chosen. To end the simulation choose **End** after selecting Loop Simulation. When necessary the output can be trimmed with D/A Trim.

3.5 TANK LINEARIZATION

In this menu it is possible to configure a linearization. 4 types of linearization's can be configured: **No Linearization, Horizontal** (Horizontal tank), **Vertical** (Vertical tank) and **Free** (Tank linearization for all other different tank shapes). For a Horizontal or Vertical Tank linearization several dimensions must be filled in. Details about these parameters are explained in the instruction manual of the Series 4000.

With the option **Free**, a linearization can be configured up to 70 points. For each linearization point a line must be added in the table as shown below. To add a linearization point, select the line where a new linearization point must be added as shown below. The **X-Axis** value must always be filled with a

percentage of the filling value of the measuring range (Span). The **Y-Axis** value must be filled with the actual reading. In the dropdown menu a **Volume Unit** can be selected, 4 units are available: Litre, Hectolitre, Kg and Tonne. Each linearization must be finalized with the X-Axis value of 100%. Save the linearization with the button Write Table. The linearization must always be saved before leaving the menu. More details about Free linearization can be found in the instruction manual of the Series 4000.



3.6 HUMAN INTERFACE

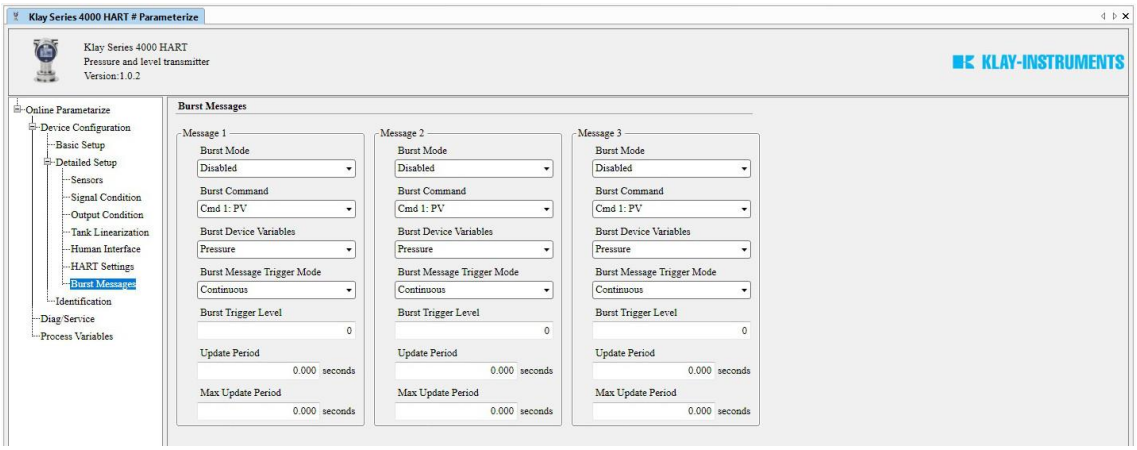
In the menu Human Interface a diversity of Readout options can be configured.
Readout: Current, Unit, Percentage, Temperature, Litre, Hectolitre, Cubic Metre, Kg and Tonne
Secondary Readout: Current, Unit Percentage and Temperature
Display Language: EN (English), ES (Spanish), NL (Dutch), FR (French), DE (German) and PL (Polish)
Backlight: On, Sleep mode and off
Local Write Protect: Open and Protected (Protection against local adjustment on the transmitter)
Write Protect: Open and Protected (Protection against adjustment by HART®)

3.7 HART SETTINGS

In this menu several HART® options can be configured. When using HART® devices in a multi-drop configuration where more than one device is in the loop, each device must be set to a different polling address. The polling address for identification to the Host device can be filled in. With the option Set Clock Time the real time clock can be set in the Field device.

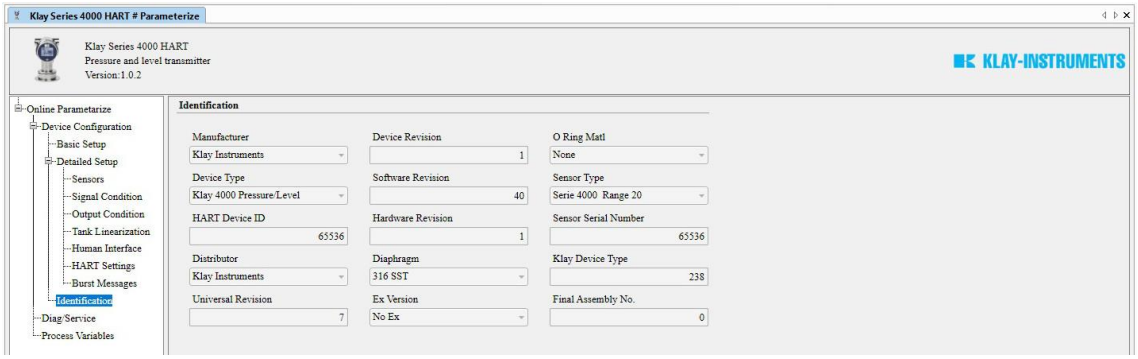
3.8 BURST MESSAGES

In this menu the transmitter can be configured for Burst mode. This will enable continuously broadcasting standard HART® reply messages. 3 (different) types of Burst messages can be configured. For a detailed explanation of the burst command, variables and message modes, details can be found in the instruction manual of the Series 4000. Depending on the Master one message will continuously be broadcasted to the Master device (when enabled).



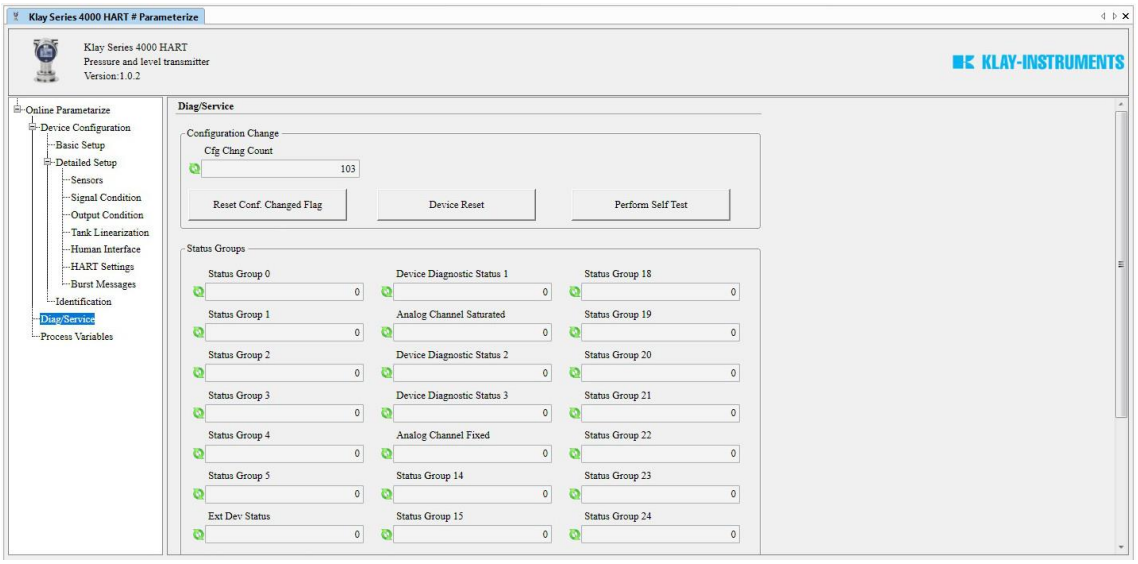
3.9 IDENTIFICATION

This menu shows data about the transmitter. This data is read-only and cannot be changed. The data contains information about: The manufacturer, type of transmitter, serial number, revision and others.



3.10 DIAGNOSTICS AND SERVICE

Diagnostic and service contains several status bits. These flags and status bits are used by the master device. **Cfg Chng Count** displays the number configured changes. With button **Device Reset**, the transmitter will restart. With button **Perform Self-Test**, the transmitter performs a hardware self-test, follow the displayed instructions.



3.11 PROCESS VARIABLES

In this menu the actual readings of the transmitter are displayed. The actual readings are refreshed every 10 seconds. The engineering unit of the pressure and temperature can be changed in this menu.