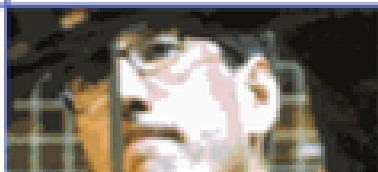


Flavio Tolfo

VIK, Edegem,  
March 21, 2002



# Vendor Neutral Interface for Field Device Configuration



# Field Device Configuration

A project may have

- > 10 Device Manufacturers
- > 100 Device Types
- > 10,000 I/Os

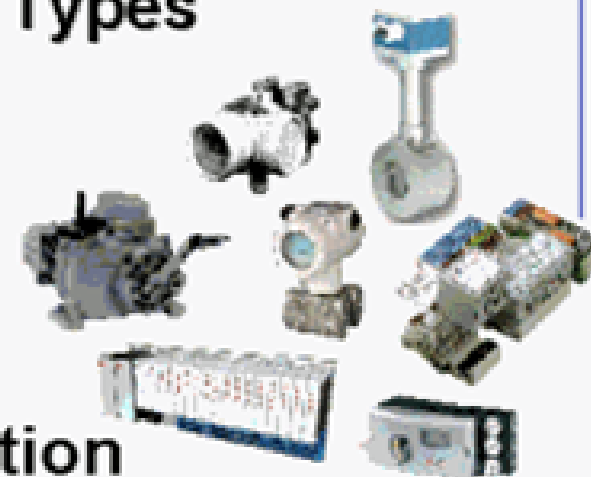
Requiring

Configuration

Parameterization

Integration

With multiple protocols



# Overall Requirements

## DCS

- Consistent, plant-wide configuration of DCS, traditional & Fieldbus devices
- Integrated device configuration and documentation
- Simplified Device integration with any fieldbus



## Devices

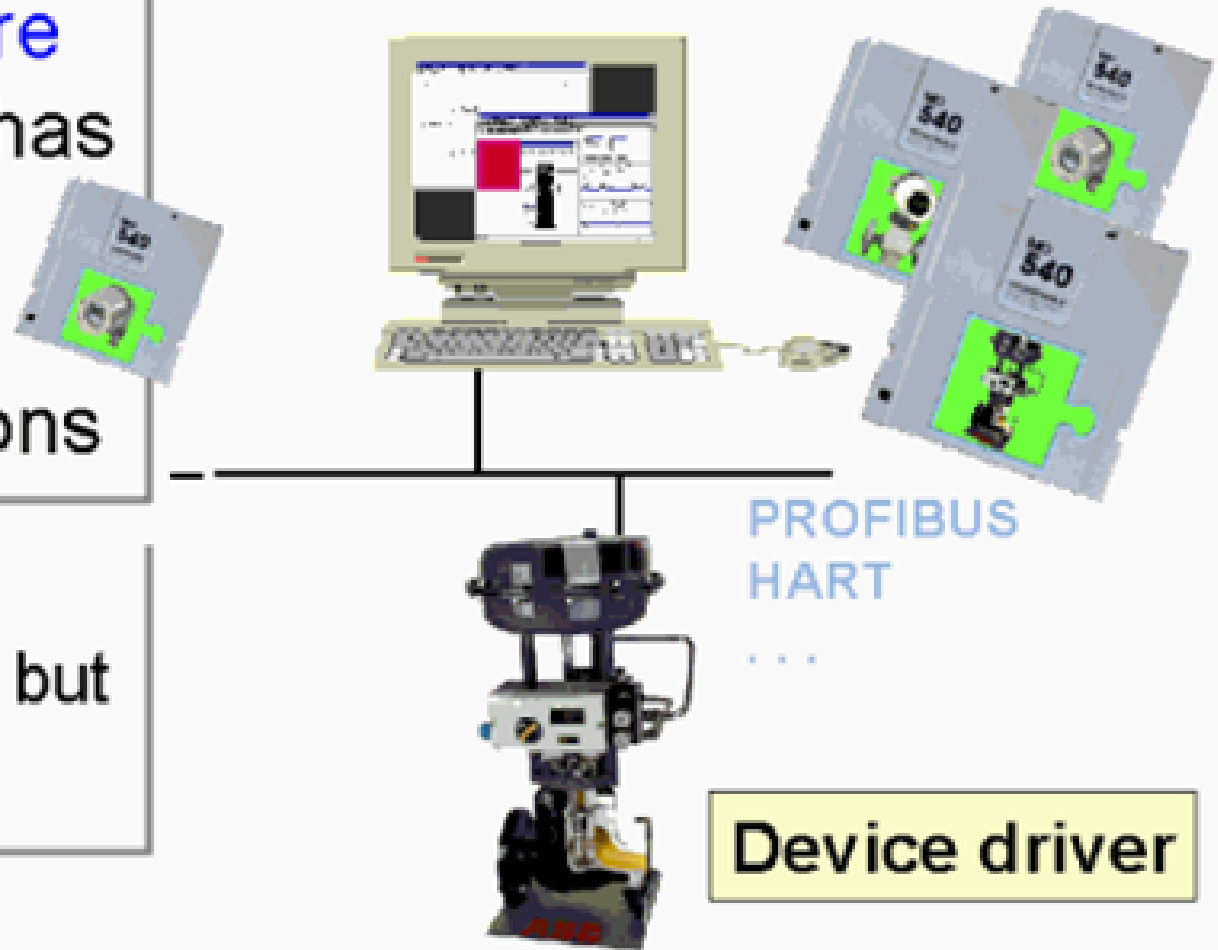
- Integration of the device in any system or tool
  - Total support for individual device features without limitations of GSD – DD approaches

# A simple solution

- The device vendor produces a **software component** which has a standard set of interfaces for engineering functions

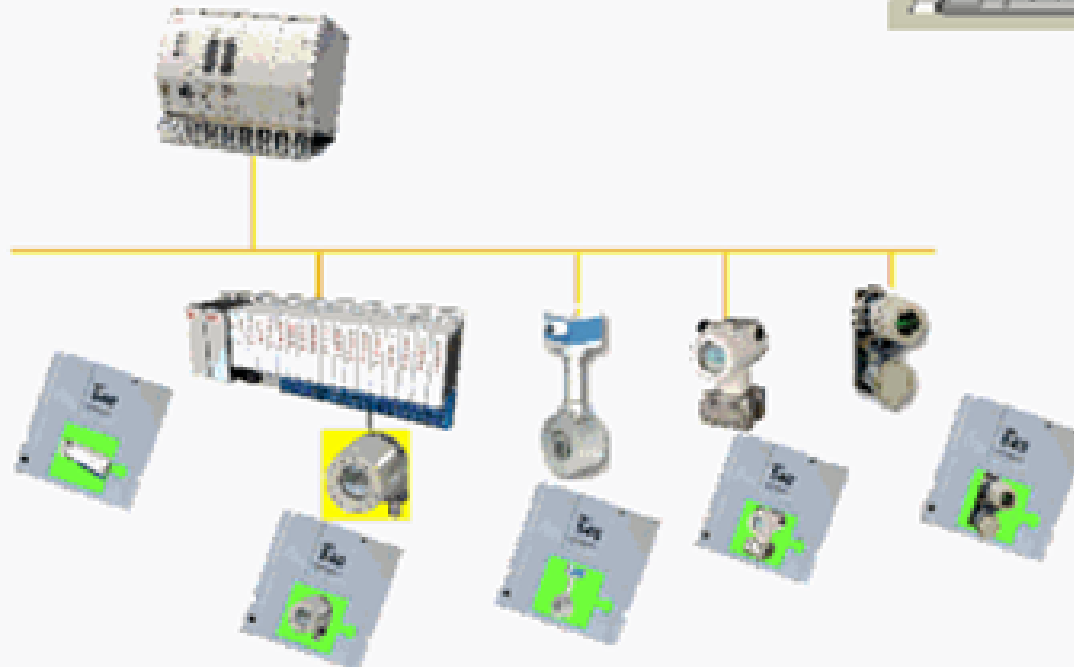
- As easy to install as a printer driver for a PC but more powerful

Automation:  
Installation of a field device

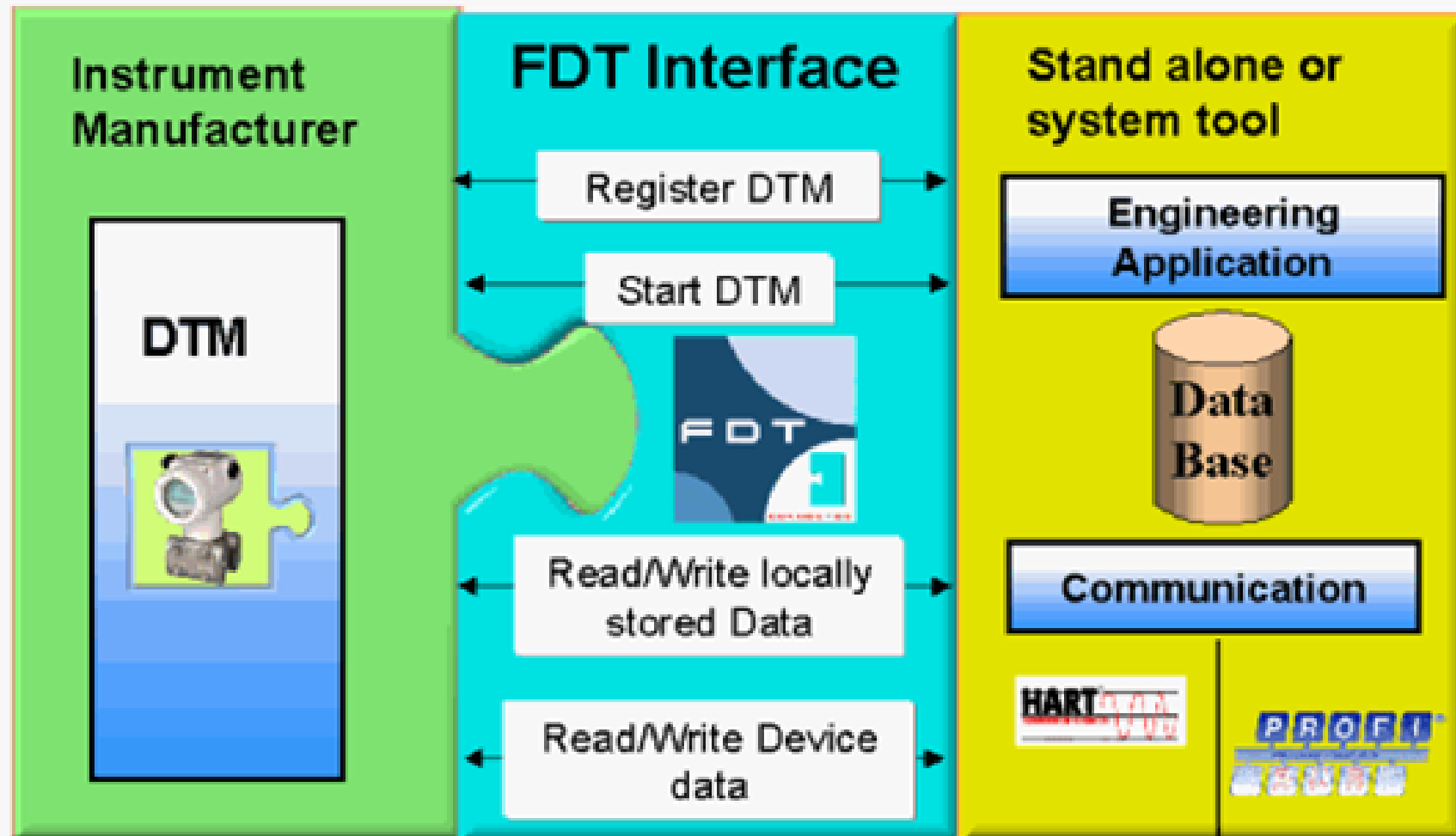


# Simple use

- The Software component could be on a disk
- The component is called the Device Type Manager (DTM)
- The DTM has interfaces as defined by the Field Device Tool (FDT) specification
- Installed in system or stand alone tool



# FDT Interface & DTM



The DTM Generates all documentation but has no storage capability

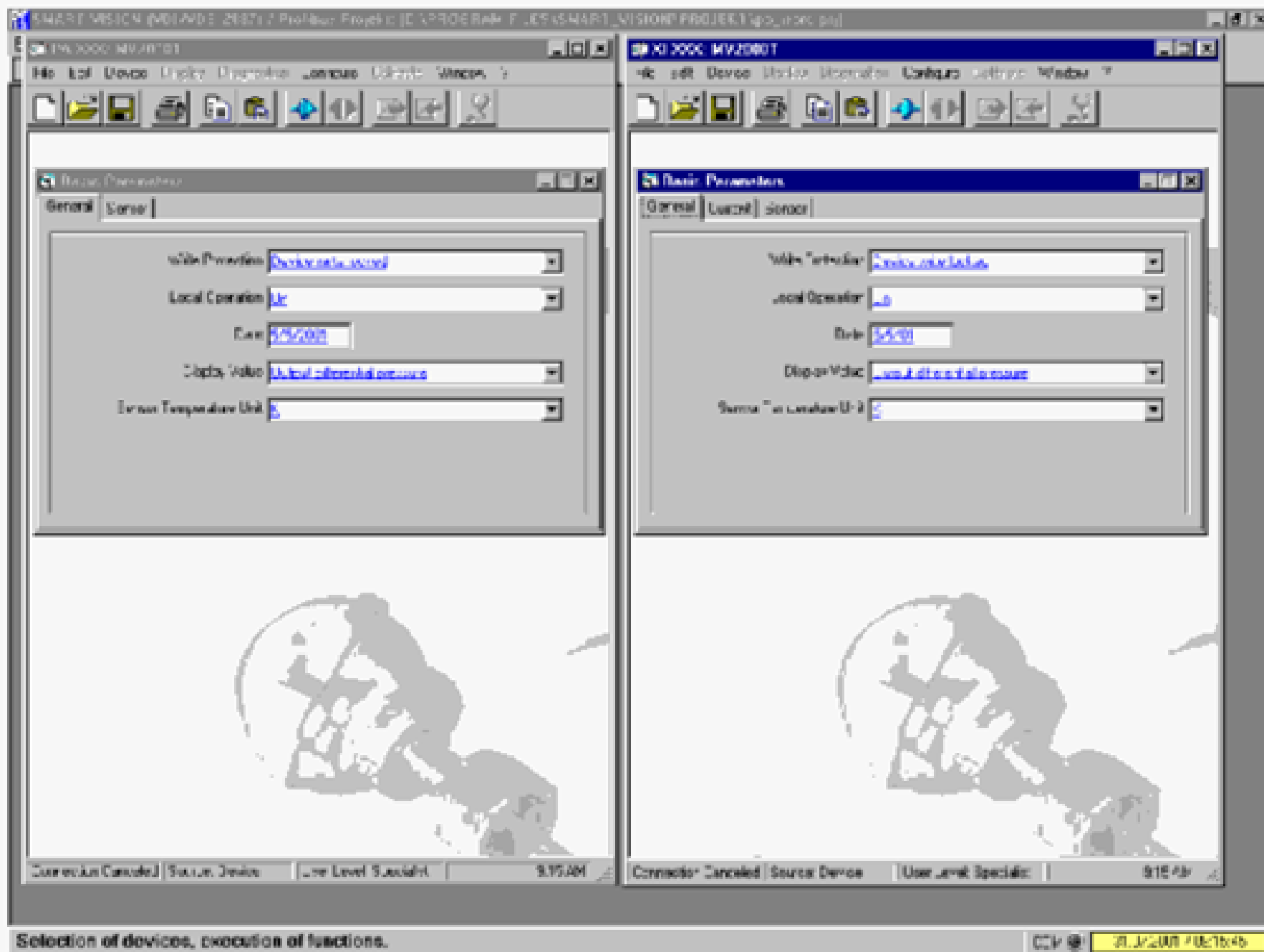
System Bus  
e. g. Ethernet



PROFIBUS

Controller  
**ABB**

# The DTM is independent of communications



# The HART DTM is on the right

The image displays two side-by-side screenshots of the HART VISION software interface. The left window, titled 'HART VISION (vdi/vde 2487) / Profibus Properties (C:\PROGRAM FILES\SMART\_VISION\PROJECTS\1\obj\www.ppt)', shows the 'Basic Parameters' configuration for a PROFIBUS device. The right window, titled 'HART VISION', shows the 'Basic Parameters' configuration for a HART DTM device.

**Left Window (PROFIBUS):**

- Write Protection: Device write locked
- Local ID number: 20
- Node: 123.0000
- Display Name: Output differential pressure
- Sensor Transmission Rate: 5

**Right Window (HART DTM):**

- Current Limits:
  - Minimum Current: 20 mA
  - Maximum Current: 205 mA
- Alarm Current:
  - Output during fault: Excessive Current
  - Low Alarm Current: 45 mA
  - High Alarm Current: 21 mA

At the bottom of each window, there is a status bar with the text 'Connection Closed', 'Source Device', 'Low Level Special', and 'E17 AM'.

**Logos:**

- PROFIBUS logo (left window)
- HART COMMUNICATION FOUNDATION logo (right window)

**ABB Logo:** A large red ABB logo is located in the bottom right corner of the overall image.

# Temperature Transmitter General

[010] T1-1003 TF12/TF217

File Device

|                        |                          |                        |                          |
|------------------------|--------------------------|------------------------|--------------------------|
| AI2-Standard Parameter | AI2-Additional Parameter | AI3-Standard Parameter | AI3-Additional Parameter |
| TR-Standard Parameter  | TR-Additional Parameter  | AI1-Standard Parameter | AI1-Additional Parameter |

General (EV)      P9-Standard Parameter      P9-Additional Parameter

Parameters

Device Type: TF12/TF212

Hardware Version: 0070-1G2C

Software Version: 1.14

Serial Number: K38611

Ident Number (PAC):

Certification:

Bus Address: 170

Device Tag: T\_1003

Date of Installation: 23th June 2007

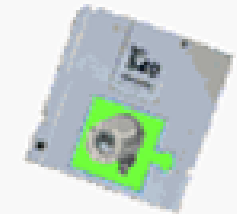
Notes: Trans: 003 Txo

Views

View: Engineering View

Not Connected      no Data loaded

The DTM provides a rich graphical user interface



# Temperature Transmitter Set-Up

010 | TI-1003 TF12/TF212

File Device ?

General (UV) Configuration (UV) Transducer Block (UV) Function Block (UV) Diagnostics (UV)

Input, Linearizing

sensor 1

Sensor Type: RTD Pt  
Base Resistance: 100.0  
Sensor Limits: min -200.0, max 050.0  
rWring: 3-wire

sensor 2

Sensor Type: H-DH  
Base Resistance: 100.0  
Sensor Limits: min -200.0, max 850.0  
rWring: 3-wire

Offset (Ch.1): 0.0

Offset (Ch.2): 0.0

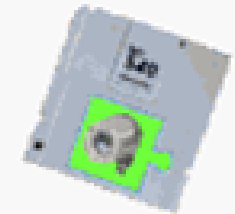
Secondary Value 1 (AFB2)

Primary Value 1 (AFB1) Unit (TB): 1/°C

Secondary Value 2 (AFB3)

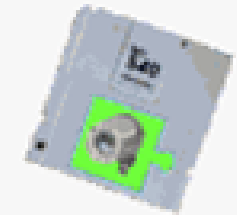
Not Connected | no Data loaded

The DTM embodies the rules for changing ALL parameters and selecting full device options.



# Temperature Transmitter FB View

The screenshot displays the ABB DTM interface for a Temperature Transmitter. It features three function blocks, each with a graphical scale and numerical parameters. The top block, 'AI Function Block 1', shows a 'Calculated Value' of 65.9 °C. The middle block, 'AI Function Block 2', shows a 'Measured Value' of 65.9 °C. The bottom block, 'AI Function Block 3', shows a 'Measured Value' of 65.9 °C. The interface includes tabs for 'General (UV)', 'Configuration (UV)', 'Transducer Block (UV)', 'Function Block (UV)', and 'Diagnostics (UV)'. A status bar at the bottom indicates 'Connected', 'Data written', and 'Status: O.K.'.



The DTM can display real-time process information.

# Temperature Transmitter Diagnostic View

The screenshot displays the 'Diagnostics (UV)' tab of the software interface. The 'General' section includes the following parameters:

| Parameter                    | Status | Action      |
|------------------------------|--------|-------------|
| Hardware (General)           | NO     | Instruction |
| ADC Calibration              | NO     | Instruction |
| Reference Junction           | NO     | Instruction |
| Memory Checksum              | NO     | Instruction |
| Initializing K <sub>in</sub> | NO     | Instruction |

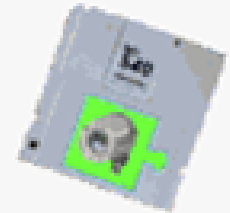
The 'Sensor 1 (Ch.1)' section shows:

| Parameter                     | Status |
|-------------------------------|--------|
| Lead Breakage                 | YES    |
| Sensor Circuit                | NO     |
| Out of Range (Sensor 1 limit) | NO     |

The 'Sensor 2 (Ch.2)' section shows:

| Parameter                     | Status |
|-------------------------------|--------|
| Lead Breakage                 | NO     |
| Sensor Circuit                | NO     |
| Out of Range (Sensor 2 limit) | NO     |

The status bar at the bottom indicates 'Connected', 'Data writer', and 'Status: Diagnostic data available'.



The DTM can be used for diagnosing problems.

# Companies that support FDT



- ABB
- ATEX Engineering
- Bagdermeter
- Bopp & Reuther
- Bürkert
- COOPER Crouse-Hinds CEAG
- Danfoss
- ELCON INSTRUMENTS
- Endress & Hauser
- Foxboro
- FSSOFT
- ICS
- ifak
- Kamstrup
- Knick
- Krohne
- Mesco Engineering
- Pepperl & Fuchs
- PNO
- SAMSON
- SIEMENS
- Softing
- VEGA
- WIKA Alexander Wiegand



# Benefits for Vendors and Users

## End User

- **Only buy one tool**
  - Reduced tool management costs
  - Reduced tool upgrade/update costs
- **Reduced learning time/cost**
  - Same GUI on stand-alone and system-integrated tools
  - Similar GUI for different protocols
- **Access to full device features**

## Vendor

- **Reduced development costs**
  - Re-use across protocols
- **Reduce costs by providing only one DTM for integration into 3<sup>rd</sup> party systems**
- **Freedom to carry out updates to both system/DTM**
  - Decoupled DTM/system development