

FDT/DTM Is A Historic Opportunity

The standardisation of the 4-20mA interface in the eighties was the first steps towards the standardisation of instrumentation and control signals. The nineties were characterised by digital communication, and in the early nineties HART established itself for digital communication on the 4-20mA current loop, whilst the first approaches were worked out towards the interoperability of exclusively digital field devices. From this, FF and Profibus-PA were developed. However, all developed solutions are operated by means of specific software tools. The present decade now faces the task of defining a higher-level software interface that enables a wide range of devices to be accessed from one tool via any communication mechanism.

Many of the software tools used today are island solutions without any claim to standardisation. Maintenance and repair personnel are constantly required to become familiar with different programs. Added to this is the incompatibility between programs and the consideration of the necessary operating systems. Despite all this, the PC/laptop has established itself for use as a configuration and diagnostics tool in many areas of automation.

The JIG

Already at the end of the nineties, the ZVEI had developed the idea of defining an open and manufacturer-independent software interface. This resulted in the FDT specification which was worked out by the Profibus User Organisation (PNO). However, in order to meet all the requirements of current communication structures, the working group moved from the PNO to form the Joint Interest Group (JIG). The objectives of this group is to maintain and further the specification. The FDT/DTM technology and JIG are Thirty-four manufacturers from process and factory automation have come together to form the FDT Joint Interest Group. This group continues to develop the open FDT system, forms working groups such as for standardising operating features, and is actively engaged in marketing. Accordingly, visitors at the latest Hannover Fair and SPS trade fair in Nuremberg were able to obtain practical information about the technology from company stands. A list of members and detailed information can be obtained at www.fdt-jig.org.

FDT concept

The FDT concept provides the basis for an open and manufacturer-independent platform. The device drivers or DTMs (Device Type Managers) are organised in a so-called frame application and arranged in a project tree according to the hardware structure. A DTM provides a complete description of a device, including the required interfaces for the frame application. It provides the user with dialogs for configuration, parameterisation and diagnostics that offer far more than present standards.

This often consists of a software product that is supplied by the device manufacturer. DTMs are divided into communication DTMs and device DTMs. In this way, FDT can be adapted to a wide range of communication technologies and their nested systems such as HART via Profibus. Based on OPC, the FDT specification ensures smooth communication between operating systems, computer hardware and connected field device. The FDT specification (Field Device Tool) contains the definition of the interfaces required for this.

The manufacturers of field devices and the associated software are obliged to conform to this specification, and the provided device drivers must also comply with the specification. Test tools ensure that the interfaces of a DTM are efficiently programmed and can be operated from the frame application. The work of the JIG has been particularly active in this area so that users are ensured of problem-free operation in their system. However, the JIG goes even further and has established a design directive to ensure the conformity of the graphical user interface.

In this way, the user benefits from an identical and vendor-independent operating method and technique that still takes into account the USPs of the device manufacturers. DTMs thus take on a standard appearance so that the previous characteristics of old island solutions disappear.



Device DTM

The frame application must be installed first of all. Different programs are offered depending on the target group. The free PACTware™ software is ideal when only parameterisation tasks are required. This can be downloaded from the website of the manufacturers (e.g. www.TURCK.com). Frame applications, such as the program Fieldcare, on the other hand, provide a complete asset management tool. Device drivers, i.e. the DTMs, can be obtained via the device manufacturers (normally via the Internet) as they are not necessarily provided with the frame applications and the setup.

The DTM is a software package and must be installed by a setup on the computer of the frame application. The frame application then maps the installed DTMs in a device catalogue. Here the DTMs are sorted by manufacturer, class, protocol or DTM, according to the catalogue view selected, so that the drivers can be found easily. The device selection is compiled in a project tree which has the computer itself as the root. Its interfaces to the devices are mapped by communication DTMs on which the device DTMs can be operated.

The created project can, for example, be the structure of a plant section. The recognition value of the plant thus simplifies the finding of the measuring point required for editing. It is also possible to structure a project so that each device type is only present once. Whatever the structure of a project, the user benefits from the use of a familiar software environment, irrespective of which manufacturer supplies the DTMs. To configure and parameterise a device, it is only necessary to call up the DTM. By standardising the user interface, it is not difficult for the user to carry out tasks in the DTM.

Device type, number of measuring points, process data, parameters and many other items are mapped in a clear structure. All parameters can be archived, so that parameter sets can be reproduced without any problem. A generic HART DTM is available for HART devices which do not have their own DTM. This allows the basic functions of the device to be set. The display of process values via the DTM not only simplifies commissioning but also troubleshooting in a running plant. Digital and analog signals can be recorded and archived via a trend window. Archived data can also be used for further processing in an application such as EXCEL. The latest measured value as well as all output states are collected for display in a monitor window. DTMs can also be used to set analog and digital outputs. This considerably simplifies commissioning and troubleshooting.

Communication DTM

As well as the device DTMs previously described, communication DTMs are also available. These provide access to the network via which the stations connected on the network can be reached. If one of these stations has a router or a gateway function in the network, its DTM provides additional interfaces to the next communication level. This nested communication enables HART field devices connected to a remote I/O system to be operated and maintained from a PC via the higher-level fieldbus. By using HART controllers in the analog modules, the remote I/O system provides here a HART multiplexer for which the DTM operates the system as well as forwarding the HART information. Time consuming individual connections between configuration tool and field devices are unnecessary, since this concept allows central and vendor-neutral access to the entire field instrumentation.