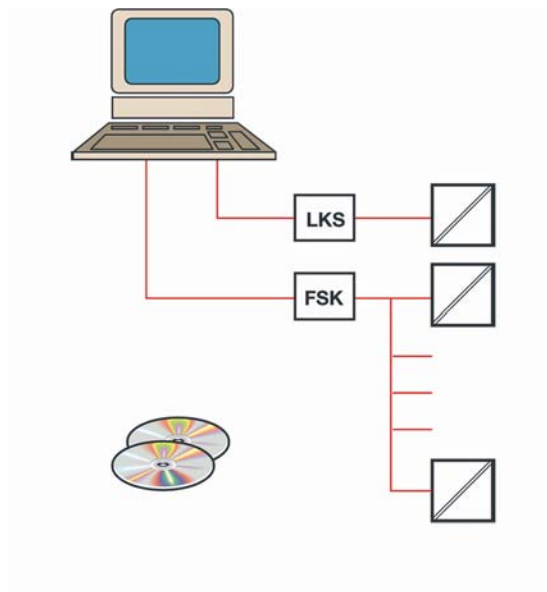# HART-Adapter

HART FSK / PC modem

— USB
— Ex(Haz.) and Non-Ex(Haz.) applications

HART FSK / PC modem II

— RS 232C
— Non-Ex(Haz.) applications

HART FSK programming set

— RS 232C
— With transmitter supply

HART LCI / PC adapter

— With small connector

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ABB

NHA121-NX, NHA121-NO HART FSK / PC-USB-Modem

Adapter

The modem NHA121-NX / -NO is designed to provide a communication link between a desktop computer or PC notebook and the HART field device. The PC can be taken into the field and connected with the HART network within seconds thanks to the USB plug & play features. Mobile data acquisition as well as parameterisation are preferred operational areas. For the use in hazardous areas we deliver an intrinsic safe, ATEX certified version: NHA121-NX. It is functionally equivalent to the NHA121-NO type.

Hardware Profile

The USB modem supports the HART specification standard. Its connector cable comes with a twisted pair wire 2-pin terminal block to dual test clips. The modem can work as primary as well as secondary Master. The modem is available with opto-isolation to the HART network. The device is USB-bus powered, thus not depending on external power supplies. The communication does not interfere with the normal operation of the field device. The interface is housed in a compact shell that attaches securely to the USB port.

Software

The interface supports the Windows operation systems and it can work like a serial modem. It offers a serial COM-port so that already existing applications can be used without any changes.

Further more a device type manager (DTM), incl. license key, is included. The DTM provides communication between devices on the HART bus and their DTMs. With its help set-up and configuration of the HART network can be done.

Device Type Manager for HART Networks (optional)

The software package HART FDT consists of the component:

• CommunicationDTM **CommDTM** for NHA121-NX / -NO.

CommDTM

The CommDTM is compliant with the current FDT specification 1.2.1. It requires the NHA121-NX/-NO as basic hardware. The DTM takes care of its management and configuration. It replaces the vendor specific configuration software with a standard FDT approach.

The CommDTM can be compared to a device driver which facilitates the communication between the field devices at the HART bus and their device DTMs. It therefore supports the commissioning of the field devices from one central workstation.

The communication interface can be employed as primary as well as secondary master. The configuration window of the CommDTM enables the user to switch between the two options. The retry limit and the number of preambles may also be set through the configuration window.

Features

The function "Device List" allows the scan for devices attached to the HART bus. All devices, which can be reached through a polling address, are listed. Additional information is available for every device found, including the tag, the vendor identification, the device type and the device ID.

In order to change the poll address of a device, it can be selected from the device list. A new window opens which permits the setting of the new poll address. The CommDTM secures that the device is not currently in use by any DeviceDTM. The device state is indicated in the device list. The CommDTM also checks whether the new poll address was already taken by another device, preventing an address overlay between different devices.

Explosion protection for NHA121-NX

Approved for connection to an intrinsically safe transmitter circuit.

Technical data	NHA121-NX	NHA121-NO
PC Interface	USB	USB
Operational Area	mobile / stationary	mobile / stationary
Modem Chip	NHA121-NX: HT2012	NHA121-NO: HT2012
Connector	2-pin test clips	2-pin test clips
Transmission Rate	1200 Bit/s (600 Bit/s optional)	1200 Bit/s (600 Bit/s optional)
DTM	HART Version 5 or higher	HART Version 5 or higher
Operating system	Windows 7, Vista, XP and 2000 (32-bit versions only)	
Certification	CE, ATEX	CE
ATEX	II (2) G [Ex ia] IIC	-
Delivery Contents	Hardware with fix USB cable and pluggable test clips, Driver and Configuration Software, CommDTM, DTM License key, Documentation on CD	

NHA102-NO

- HART FSK Modem II
- Digital communication through FSK (standard HART Protocol)
- Communication by tapping at the analog 4 ... 20 mA signal transmission
- Potential separation between the PC and the device
- Average-free signal transmission, hence unaffected 4 ... 20 mA output signal
- Digital signals, "0" = 2.2 kHz; "1" = 1.2 kHz
- IP 20

Applications

The FSK modem acts as a sort of digital communication "translator" between the computer and the transmitter. Power supply is realized automatically via the serial RS 232C interface of the computer, in parallel with data transmission.

Communication is done by tapping at any point of the analog 4 ... 20 mA signal transmission. No special attention has to be paid to polarity for the 2-pole tap. The devices are HART-compatible, i. e. they have a certain internal resistance, which must be considered. Power for data tapping is supplied in parallel from the PC via the RS 232 C interface.

The modem has a 9-pin or 25-pin Sub-D socket on the PC side and is connected to the transmitter via 0.75 m cables with clip-on connectors on the device side. The cables connect to the modem through screw terminals.

Technical data

Voltage U_{ss}
0.6 V, average-free

Current
< 3 mA

Power
max 1.5 mW

Frequency
1.2 and 2.2 kHz
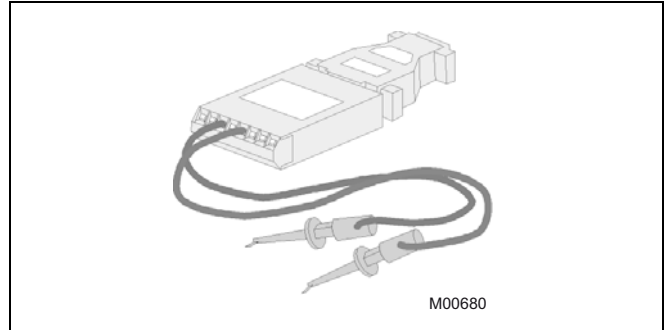
Electromagnetic compatibility (EMC)
to IEC 801 / NAMUR

M00680

Fig. 1

Environmental capabilities

Operating temperature
0 ... 45 °C

Storage temperature
-20 ... 55 °C

Air humidity
< 80 %

Housing

Material
Plastic

Degree of protection
IP 20

Connectors
9-pin or 25-pin Sub-D socket (PC side),
screw terminals and 0.75 m cables with clip-on connectors (device side)

Dimensions
55 mm x 55 mm x 17 mm

Weight
approx. 0.1 kg

Connection diagram, with 250 Ω communication resistor

1) Internal resistance for supply unit > 250 Ω
(resistance can also be realized as external communication resistor)
2) Internal resistance for signal source >10 kΩ

M00681

Fig. 2

Connection diagram, without 250 Ω communication resistor
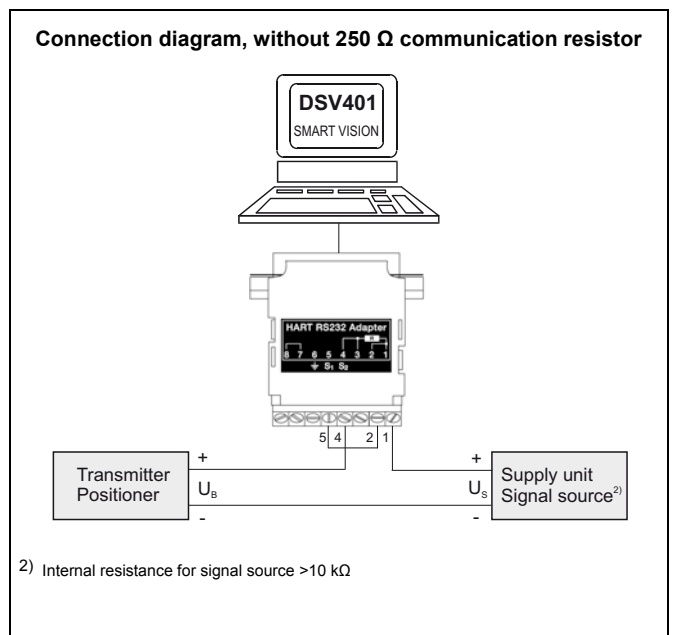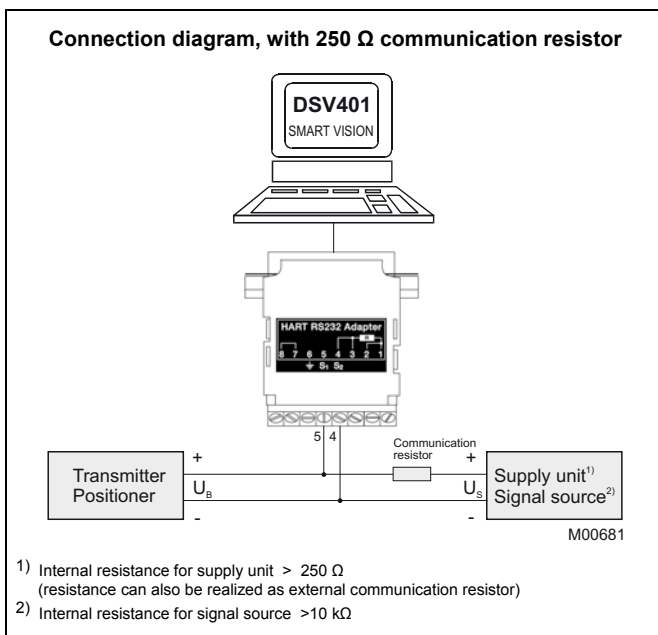
2) Internal resistance for signal source >10 kΩ

NHA201-NO

LCI adapter: In offline mode (e. g. in the shop or lab) the local communication interface (LCI) can be used for parameterization. In this case the transmitter is powered via the PC. In online mode local communication is possible without affecting the analog output.

The LCI adapter is used to connect the transmitter to the PC.

Universal through 9-pin or 25-pin SUB D connector
-   with small connector for:
    Positioner, TEU421, TEU471, BCI100 (Contrans I),
    Power Transducer SU.
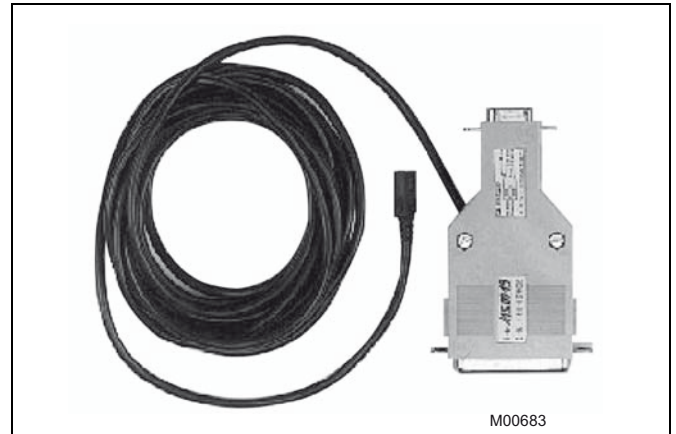
Fig. 3

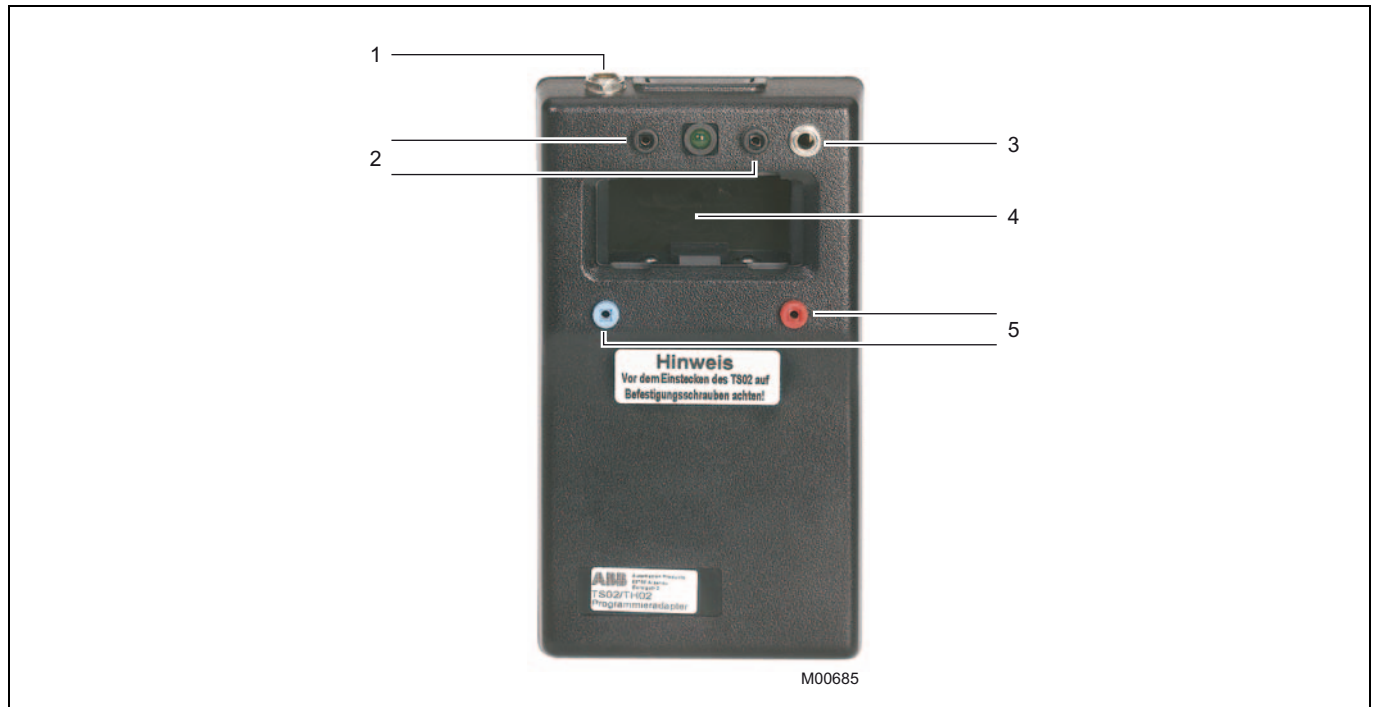## Programming set with transmitter supply

Fig. 4

Programming box

Fig. 5

1   Power supply jack
2   Optionally: Jack for NHA102-NX (FSK Modem II-Ex)

3   Jack for NHA102-NO (FSK Modem II)
4   Receptacle for TH01 or TH02 transmitters
5   Jacks for HART devices
     that do not fit in the receptacle

Modem connectors

Programming set with NHA102-NO (FSK Modem II) for local programming

-   with NHA102-NO (HART FSK Modem II), programming box, universal power supply 110 ... 220 V
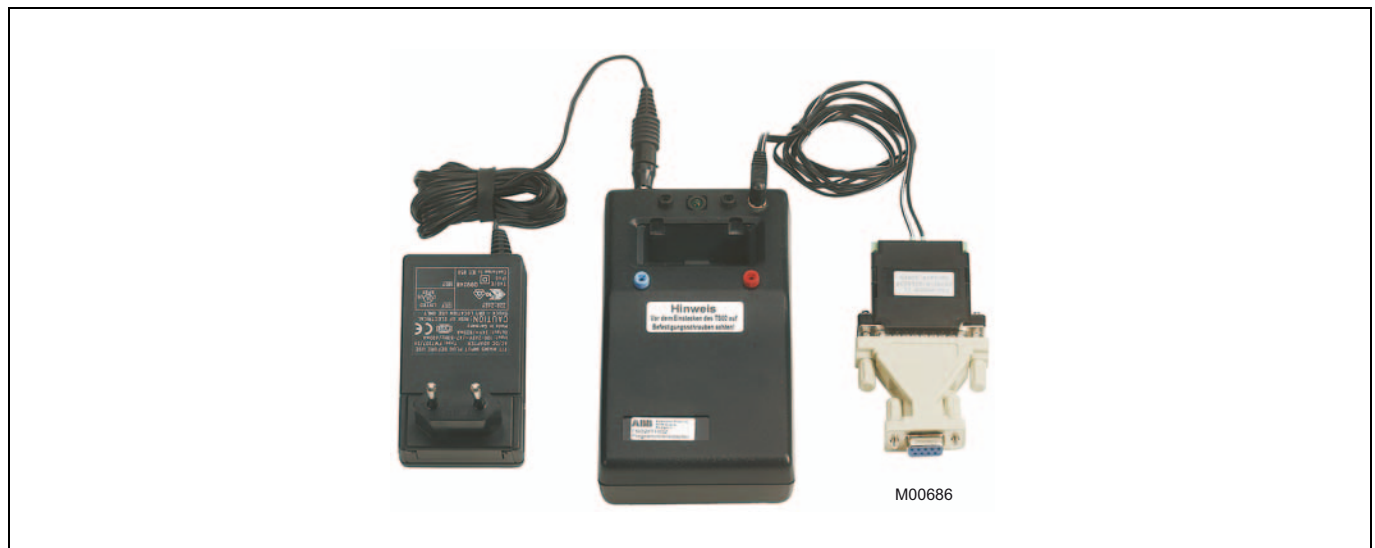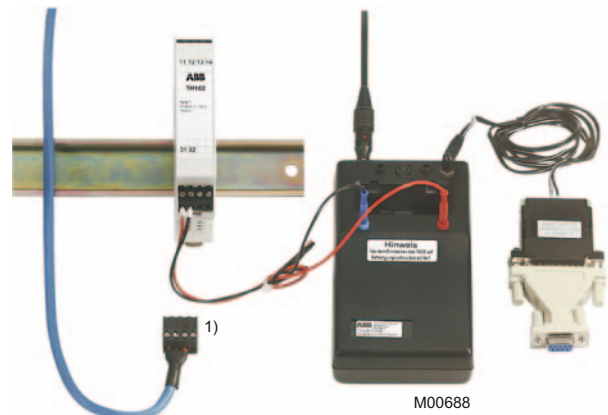-   with universal power plug (a Euroconnector is shown here as an example)

Fig. 6

Examples for transmitter connection

M00687

For TH01 and TH02

M00688

Programming TH101 and TH102 railmounted transmitters

[1] Remove the connection wires and connect the plug of the
programming set

M00689

For TH202

Note:
When removing the indicator, take the shorting bar out of
its retainer and put it in the place where the indicator has been
located so far.

Fig. 7

Ordering information

HART-FSK / PC-adapter			Catalog No.
NHA121-NX	(14290-0203)	1)	3KDE636710L0001
USB / HART FSK Modem, IS input II (2) G [Ex ia] IIC, electrical isolation, for Windows 7, Vista, XP and 2000 (32-bit versions), to connect a tool to HART devices via a PC / Notebook incl. standard driver and Common DTM (FDT 1.2.1), DTM license key, USB cable, connection cable with clips and manual (*.pdf)			
NHA121-NO	(14290-0105)	1)	3KDE636710L0002
USB / HART FSK Modem, Electrical isolation, for Windows 7, Vista, XP and 2000 (32-bit versions), to connect a tool to HART devices via a PC / Notebook incl. standard driver and Common DTM (FDT 1.2.1), DTM license key, USB cable, connection cable with clips and manual (*.pdf)			
NHA102-NO		1)	63671-7957838
RS 232C / HART FSK Modem II, connector version, with connection clips			
FSK-programming set (with transmitter supply)		1)	
NHA102-NO (RS 232C / HART FSK Modem II), programming box, universal power supply 110 ... 220 V with universal power plug			63671-7957471
NHA102-NO programming box, universal power supply 110 ... 220 V with universal power plug, without modem			63671-7957772
HART-LCI / PC adapter			Catalog No.
NHA201-NO			63671-319621
RS 232C / LCI-Adapter with small connector, for positioners, TEU421, TEU471, BCI100 (Contrans I modules), Power Transducer SU			

1) for configuration of general HART-instruments and TH(x)01, TS(x)02, BCI100 (Contrans I) backplane

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