azbil

Device Management System
⚙ InnovativeField Organizer™ [R 41]

What is InnovativeField Organizer?

InnovativeField Organizer (hereinafter IFO) is a device management system for smart field devices that supports FOUNDATION™ fieldbus and HART® Communication Protocol.

Features

- Contributes to fast commissioning using improved methods of adjusting, checking, and testing field devices and control valves before startup/restart of plant.
- Once plant operation has started, IFO monitors the status of field devices 24 hours a day, 365 days a year to detect any changes in the device at the earliest stage possible.
- With full-time connection HART communication, IFO monitors the status of operating devices with outstanding communication performance.
- During plant operation, control valves are continuously diagnosed online.
- Supplies quantified indicators for control valves for condition-based maintenance.
- IFO can be introduced without affecting DCS software simply.
- The status of devices is displayed in conformity with alarm standard 107 of the European user association NAMUR (hereinafter NAMUR NE107) and with Fieldbus Foundation FF912.

Advantages

- Supports quick and accurate plant startup by providing strong support for device connection checks, configuration/calibration, inspections, and loop tests before the plant starts.
- Once the plant has started operation, the operation status of field devices is monitored 24 hours a day, 365 days a year. By detecting field device abnormalities at an early stage, IFO brings the opportunities to prevent unscheduled plant shutdown.
- IFO assists plant managers to make the transition from time-based maintenance to condition-based maintenance, allowing them to create appropriate maintenance plans based on the actual degree of deterioration of control valves as indicated by CV diagnostic data.

Function Overview

Display of Device Status

The operation status of field devices is displayed in a tree format that corresponds to the management hierarchy or system configuration of the plant equipment.
This format provides operators and maintenance staff with a device management screen that can be viewed easily, offering excellent convenience and device visibility.
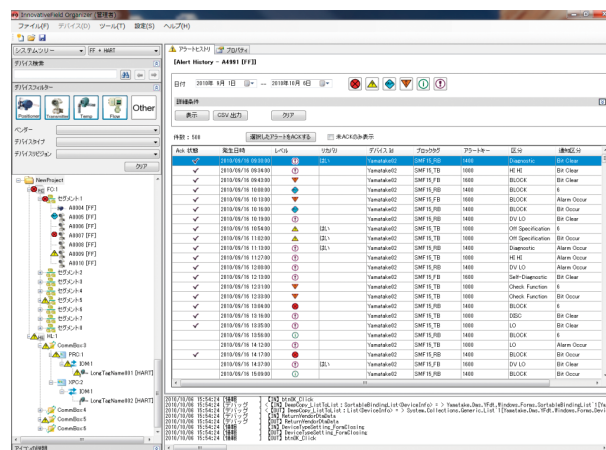

Figure 1. Device Management Screen

In the device tree, IFO displays device status with symbols that comply with NAMUR NE107 (NAMUR, 2006).
When an alert status is detected for a device, a message is recorded with a time stamp of the occurrence time and is saved as alert history information

Table 1. Symbols compliant with NAMUR NE107

Symbol	Description
	Maintenance Required
	Out of Specification
	Check Function
	Failure

Adjustment and Setting

Field devices made by manufacturers other than Azbil Corporation can be adjusted and set using the device type manager (DTM) or Device Description (DD/EDD) provided by the field device manufacturer.
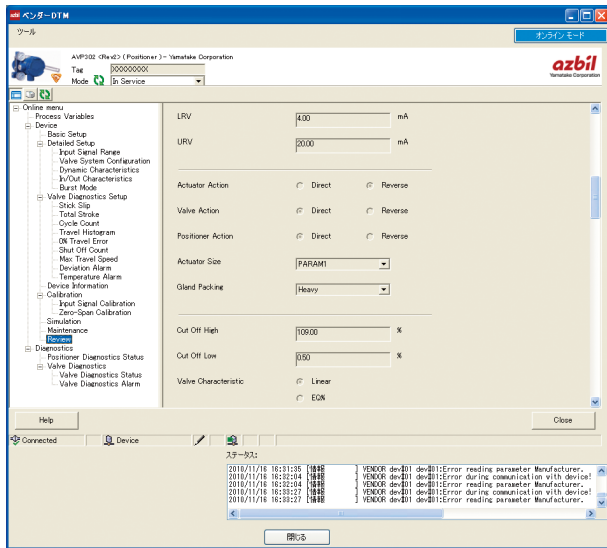

Figure 2. DTM for Azbil Corporation's AVP302

For field devices that support FOUNDATION fieldbus, the device description (DD) or electronic device description (EDD) provided by the manufacturer can also be used to adjust the device settings.

Real-time Trends

Various signals measured by HART devices can be easily monitored on the Trends tab.
Real-time Trends is a function for displaying the values measured by any HART device (max. 8 values) in a time-series graph. No special settings are required, and the measured values can be displayed simply by selecting the device.
Several variables can be charted in the graph for each device, and graphs can be used for many purposes, such as monitoring the actual valve travel or the device temperature, or diagnosing and monitoring impulse pipe clogging.

Tag Commissioning

IFO user can be easily and quickly checked whether exact field devices are connected or not. Then the report can be created.

Support for Loop Tests

Quick trial run preparations, pre-startup preparations, and loop tests are supported.
Conventional, troublesome three or five point checks using simulated signal input from a handheld terminal can be automated and accompanied by operation testing and report creation.
This function is available for HART devices that support HART command 40.

Support for Interlock Test and Sequence Tests

IFO provides a batch handling tool for outputting simulated signals. When an IFO user executes the DCS Interlock Test or Sequence Test, this tool can be used to instruct simulated signal output to many field devices in one operation. With conventional methods, many people would be required in order to input simulated signals to multiple field devices. This function is available for HART devices that support HART command 40.

Automated report generation of device parameters

Usually, after completing adjustment of field devices and before starting operation at a plant, workers must collect parameter data from all the field devices and record this master data in a register.
Until now workers have had to go around to each individual device, but using IFO enables them to record the parameters of multiple devices in one batch, and it automatically creates data reports.
The parameters defined by the data report output function of DTM or DD provided by device vendors are output.

Diagnostics Application

In addition to the internal self-diagnostics executed by field devices, sophisticated device-specific diagnostic mechanisms and management functions specially made for the devices, which cannot be realized by a DTM only, are provided as optional plugin applications for IFO.

■ PLUG-IN Valstaff (Control Valve Diagnostic Maintenance Support Package)

PLUG-IN Valstaff makes the major valve management functions of Valstaff, Azbil Corporation's control valve maintenance support system, available on IFO. In combination with Azbil's AVP Smart Valve Positioner, PLUG-IN Valstaff provides online CV diagnostics, positioner auto-setup, automated step response test, and valve signature test*.

*   Valve signature test can be executed combining with Smart Valve Positioner 700 series.
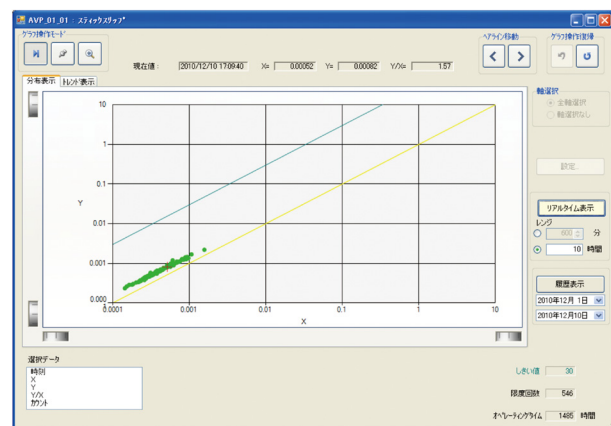

Figure 3. Stick-Slip Diagnostics

System Configuration

For Advanced-PS (TDCS3000)

Digital field devices and IFO can be connected using HART communication.

If process controller I/O modules are the base unit type, HART-compliant I/O modules (BU100H series) can be mounted on them.

BU100H modules are mounted in communication slots that connect to digital field devices (HART). The modules and IFO are connected using a device communication network (Ethernet).
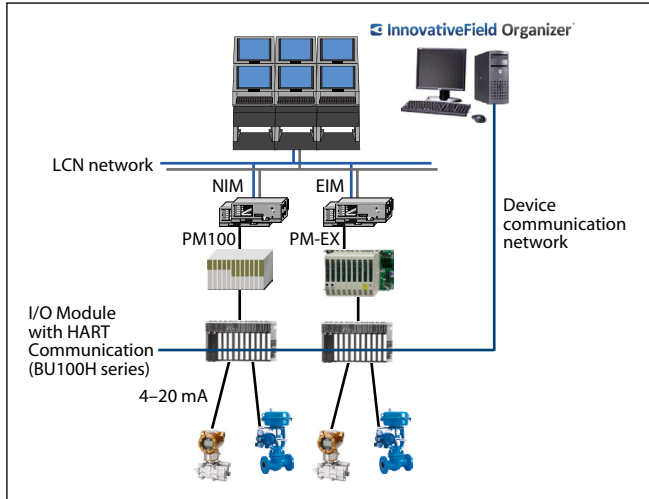

Figure 4. IFO Configuration for Advanced-PS/TDCS3000

For Harmonas-DEO

Digital field devices can be connected to IFO using HART communication or FOUNDATION fieldbus.

For HART communication, HART-compliant I/O modules (BU100H series) can be mounted on the base unit I/O modules connected to the process controllers. BU100H modules are mounted in communication slots that connect to digital (HART) field devices. The modules and IFO are connected using a device communication network (Ethernet). To use FOUNDATION fieldbus with high-speed communication, a FOUNDATION fieldbus-compatible process controller (DOFC) is used between IFO and digital (FOUNDATION fieldbus) field devices.

Note
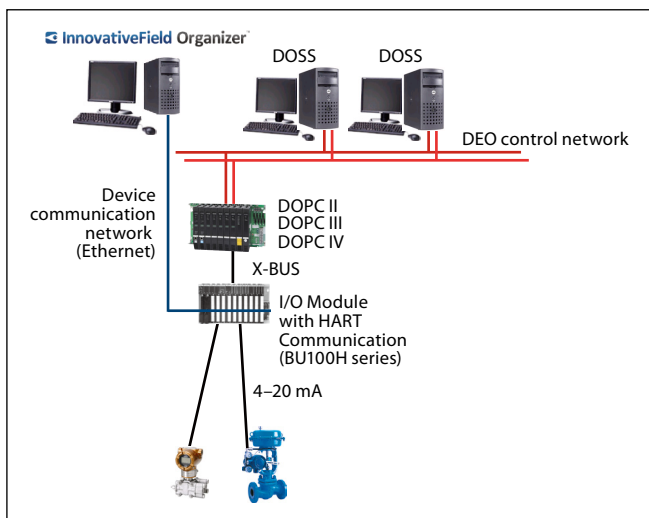To use DOFC, the version of Harmonas-DEO must be R400 or later.

Figure 5. IFO Configuration for Harmonas-DEO

IFO system configuration which is independent from DCS

1. HNU (HART Network Unit)

By using a HART Network Unit (HNU), HART-compliant digital field devices can be connected to IFO regardless of the type of the DCS.

The AI/AO terminals or relay terminals of the DCS are connected to the HNU with analog wiring, and an Ethernet device communication network is used to link the HNU to IFO.
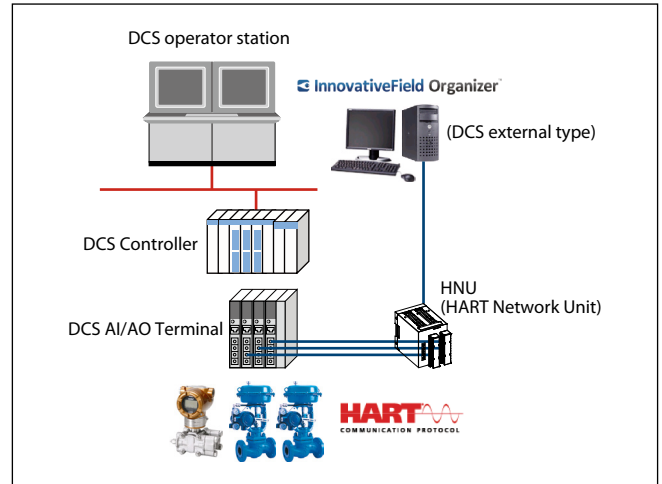

Figure 6. IFO system configuration which is independent from DCS

2. HART modem

Commercially available HART modems can be used as the communication interface between IFO and HART devices. Connect the HART modem to the COM port of IFO, and the HART modem banana plugs to the DCS's analog input and output lines. By connecting multiple HART modems to IFO, up to 4 HART devices can be connected.

This portable device diagnostic tool can be used to check device operation before IFO is installed.

Notes
- A HART modem connection cannot coexist with an Ethernet connection to a BU100H HART I/O module or HART Network Unit (HNU) in the same IFO system.
- This connection cannot coexist with other connection to a HART master device (HART multiplexer, HART I/O module, HART communication tool, etc.). If the destination DCS is connected to a HART master device, disable HART communication with the master device using the device management system before connecting the HART modem. To connect a HART master device if a HART modem connection is established, disable HART communication (periodic data collection) using IFO before connecting the HART master device.
- If multiple HART modems are connected to IFO, the same number of interfaces (USB, RS232, etc.) as the number of connected modems is needed.
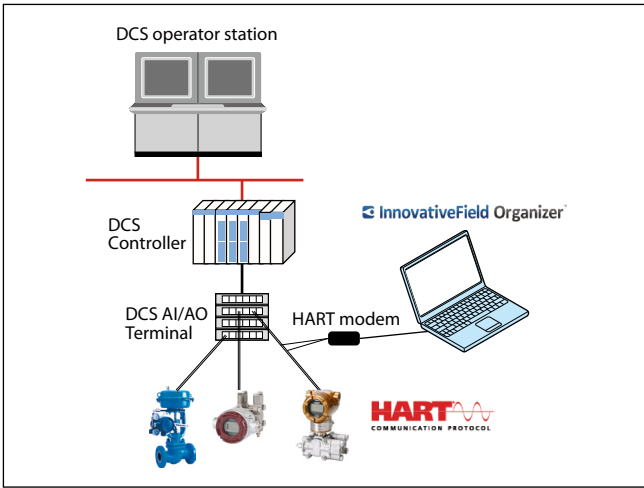
Figure 7. IFO system configuration via a HART modem

3.   HART multiplexer
Commercially available HART multiplexers can be used as the communication interface between IFO and HART devices.

4.   HART-IP
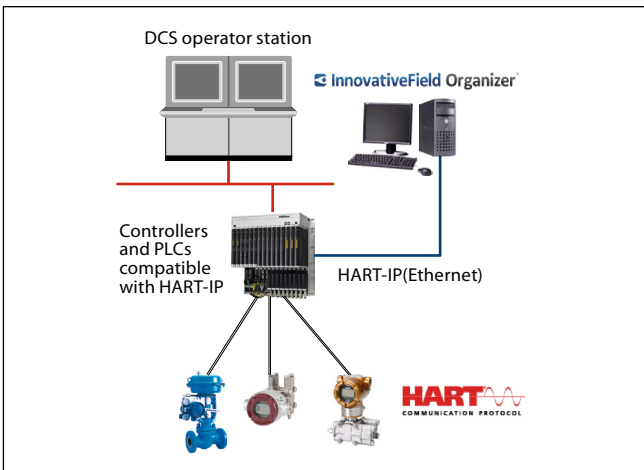Controllers and PLCs compatible with HART-IP can be connected to IFO via Ethernet using their HART-IP port.

Figure 8. IFO system configuration via HART-IP

System Specifications

Table 2. Application specifications

Maximum number of supported devices	3000 devices/system
Client/server configuration	Client/server configuration not supported (to be supported in a future version)

Table 3. Computer platform operating environment

Operating system	Windows 7 Professional SP1 64 bit Windows 10 Pro
Memory	At least 4 GB RAM
Free space of C drive	At least 20 GB
Network	Wired LAN

Note: For a HART modem connection, a commercially available HART modem is needed. The computer must have an interface (USB or RS232 port) for a HART modem connection. Azbil Corporation has verified compatibility with the HART modems listed below. For connection to modems other than the following, contact the azbil Group.
For AVP302/202/102 positioners which do not have a HART certification label on the main unit, please use the Bell202 modem provided by M-System Co.
• VIATOR USB HART Interface made by MACTek Inc.
• VIATOR RS232 HART Interface made by MACTek Inc. (Note that an RS232-USB converter cannot be used.)
• Bell202 modem (model: COP-HU) by M-System Co.

Note: Azbil Corporation has already verified compatibility with the HART-IP controller below. For connection to models other than the following, contact the azbil Group.
• HIMax made by HIMA

Note
Please contact us for recommended HART multiplexers that are commercially available.

License System

InnovativeField Organizer

Table 4. InnovativeField Organizer base license

	Model number	Description
License for number of device connection	FNV-IFO4XE00	InnovativeField Organizer R4x base license 16TAG entry edition
	FNV-IFO4XE01	InnovativeField Organizer R4x base license 100TAG
	FNV-IFO4XE03	InnovativeField Organizer R4x base license 300TAG
	FNV-IFO4XE05	InnovativeField Organizer R4x base license 500TAG
	FNV-IFO4XE10	InnovativeField Organizer R4x base license 1000TAG
	FNV-IFO4XE20	InnovativeField Organizer R4x base license 2000TAG
	FNV-IFO4XE30	InnovativeField Organizer R4x base license 3000TAG
	FNV-IFO4XEMS	InnovativeField Organizer R4x Modem license set

Table 5. InnovativeField Organizer AVP limited license for PLUG-IN

	Model number	Description
License for number of AVP connection	FNV-IFO4XEV1	InnovativeField Organizer R4x license AVP only 16TAG entry edition
	FNV-IFO4XEV2	InnovativeField Organizer R4x license AVP only 25TAG
	FNV-IFO4XEV3	InnovativeField Organizer R4x license AVP only 50TAG
	FNV-IFO4XEV4	InnovativeField Organizer R4x license AVP only 100TAG
	FNV-IFO4XEV5	InnovativeField Organizer R4x license AVP only 200TAG
	FNV-IFO4XEV6	InnovativeField Organizer R4x license AVP only 300TAG
	FNV-IFO4XEV7	InnovativeField Organizer R4x license AVP only 500TAG
	FNV-IFO4XEV8	InnovativeField Organizer R4x license AVP only 750TAG
	FNV-IFO4XEV9	InnovativeField Organizer R4x license AVP only 1000TAG

Table 6. InnovativeField Organizer DCS connection license

	Model number	Description
License for DCS connection	FNV-IFO4XE-A	InnovativeField Organizer R4x DCS connect license for APS/TDCS
	FNV-IFO4XE-B	InnovativeField Organizer R4x DCS connect license for DEO R400 or earlier
	FNV-IFO4XE-C	InnovativeField Organizer R4x DCS connect license for DEO R410 or later
	FNV-IFO4XE-Y	InnovativeField Organizer R4x DCS connect license for Other DCS

Table 7. InnovativField Organizer TAG extension license

After IFO is installed, this license is used to increase the number of connected devices.

	Model number	Description
License for number of device extension	FNV-IFO4XEP1	InnovativeField Organizer R4x TAG extension license 16to100
	FNV-IFO4XEP2	InnovativeField Organizer R4x TAG extension license 100to300
	FNV-IFO4XEP3	InnovativeField Organizer R4x TAG extension license 300to500
	FNV-IFO4XEP4	InnovativeField Organizer R4x TAG extension license 500to1000
	FNV-IFO4XEP5	InnovativeField Organizer R4x TAG extension license 1000to2000
	FNV-IFO4XEP6	InnovativeField Organizer R4x TAG extension license 2000to3000

Table 8. InnovativField Organizer AVP limited extension license

After IFO is installed, this license is used to increase the number of connected AVPs.

	Model number	Description
License for number of AVP extension	FNV-IFO4XEW1	InnovativeField Organizer R4x for AVP limited TAG extension license 16to25
	FNV-IFO4XEW2	InnovativeField Organizer R4x for AVP limited TAG extension license 25to50
	FNV-IFO4XEW3	InnovativeField Organizer R4x for AVP limited TAG extension license 50to100
	FNV-IFO4XEW4	InnovativeField Organizer R4x for AVP limited TAG extension license 100to200
	FNV-IFO4XEW5	InnovativeField Organizer R4x for AVP limited TAG extension license 200to300
	FNV-IFO4XEW6	InnovativeField Organizer R4x for AVP limited TAG extension license 300to500
	FNV-IFO4XEW7	InnovativeField Organizer R4x for AVP limited TAG extension license 500to750
	FNV-IFO4XEW8	InnovativeField Organizer R4x for AVP limited TAG extension license 750to1000

PLUG-IN Valstaff

Table 9. PLUG-IN Valstaff base license

	Model number	Description
License for number of device connection	FNV-IFV4XE01	PLUG-IN Valstaff R4x license 16TAG entry edition
	FNV-IFV4XE02	PLUG-IN Valstaff R4x license 25TAG
	FNV-IFV4XE05	PLUG-IN Valstaff R4x license 50TAG
	FNV-IFV4XE10	PLUG-IN Valstaff R4x license 100TAG
	FNV-IFV4XE20	PLUG-IN Valstaff R4x license 200TAG
	FNV-IFV4XE30	PLUG-IN Valstaff R4x license 300TAG
	FNV-IFV4XE50	PLUG-IN Valstaff R4x license 500TAG
	FNV-IFV4XE75	PLUG-IN Valstaff R4x license 750TAG
	FNV-IFV4XEA0	PLUG-IN Valstaff R4x license 1000TAG

Table 10. PLUG-IN Valstaff DMS connection license

	Model number	Description
License for DMS connection	FNV-IFV4XE01	PLUG-IN Valstaff R4x license 16TAG entry edition
	FNV-IFV4XE02	PLUG-IN Valstaff R4x license 25TAG

Table 11. PLUG-IN Valstaff TAG extension license
After PLUG-IN Valstaff is installed, this license is used to increase the number of connected devices.

	Model number	Description
License for number of device extension	FNV-IFV4XEP1	PLUG-IN Valstaff R4x TAG extension license 16to25
	FNV-IFV4XEP2	PLUG-IN Valstaff R4x TAG extension license 25to50
	FNV-IFV4XEP3	PLUG-IN Valstaff R4x TAG extension license 50to100
	FNV-IFV4XEP4	PLUG-IN Valstaff R4x TAG extension license 100to200
	FNV-IFV4XEP5	PLUG-IN Valstaff R4x TAG extension license 200to300
	FNV-IFV4XEP6	PLUG-IN Valstaff R4x TAG extension license 300to500
	FNV-IFV4XEP7	PLUG-IN Valstaff R4x TAG extension license 500to750
	FNV-IFV4XEP8	PLUG-IN Valstaff R4x TAG extension license 750to1000

External Storage

Automatic backup and external storage is available for control valve diagnostic data collected by PLUG-IN Valstaff operating in IFO.
For automatic back-up, the user can use the following operability-confirmed external storage media.
- Tanberg Data Inc.
  RDX QuikStor External USB Docking Station
  Model: 8782
- Tanberg Data Inc.
  RDX QuikStor Cartridge (Memory: 1 TB)
  Model: 8586

Tanberg Data Inc. web site:
                    http://www.tandbergdata.com/us/

Notes
When using external storage for automatic back-up, keeping your PC safe is a necessity. However, please do not install anti-virus software on the PC used for IFO. Instead, do virus-checking remotely from another PC.
Also, if an external storage device whose operation we have not checked is used, Azbil Corporation cannot guarantee its operation or the integrity of the data. If the lack of a guarantee is acceptable and an external storage device which we have not checked is used, please use a device that meets the following conditions at a minimum.
- This device does not require special software (do not install software other than Azbil products on the PC used for IFO).
- This device does not incorporate a security function.

About icons for safety precautions

The safety precautions described in this document are indicated by the following icons.

⚠ **WARNING**	Warnings are indicated when mishandling this product might result in death or serious injury.
⚠ **CAUTION**	Cautions are indicated when mishandling this product might result in minor injury to the user, or only physical damage to the product.

■ Example

🚫	The indicated action is prohibited.
❗	Be sure to follow the indicated instructions.

Safety precautions

⚠ CAUTION	
🚫	Do not touch electrically charged parts such as the power supply terminals. Doing so may result in an electric shock.
❗	Back up data and check for viruses regularly. Failure to do so may result in corrupted data or program malfunction.
🚫	Do not install any anti-virus software into this PC. Check for viruses remotely from another PC.
❗	When using the loop check tool, exit these other tools first. • Vendor DTM • Device Description • PLUG-IN Valstaff • Device Watcher The loop check tool may operate in unexpected ways.
❗	Before executing an AI check, stop programs such as control programs and interlock programs. Failure to do so may change the input value for the DCS, resulting in an unexpected operation.
❗	Before executing an AO check, stop programs such as control programs and interlock programs. Also stop programs in the case of a DCS that is not made by Azbil Corporation. Otherwise, since an input value is written to the DCS, an unexpected operation may occur.
❗	Before connecting the HART modem, inform operators in the control room that devices will be operate. Unexpected device behavior can injure workers.
❗	Before using PLUG-IN Valstaff online while devices are operating, please make sure that HART communication will not affect the host control system.

- Valstaff is a trademark of the Azbil Corporation.
- FONDATION is a trademark of Fieldbus Foundation.
- HART® is a trademark of HART Communication Foundation.
- Windows 7, Windows XP, Windows Vista, Windows Server 2003 and Windows Server 2008 are trademarks of Microsoft Corporation in the USA and other countries.
- Other product names, model nos., and company names may be trademarks of the respective company.

Please, read 'Terms and Conditions' from following URL before the order and use.

http://www.azbil.com/products/factory/order.html

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Specifications are subject to change without notice.

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