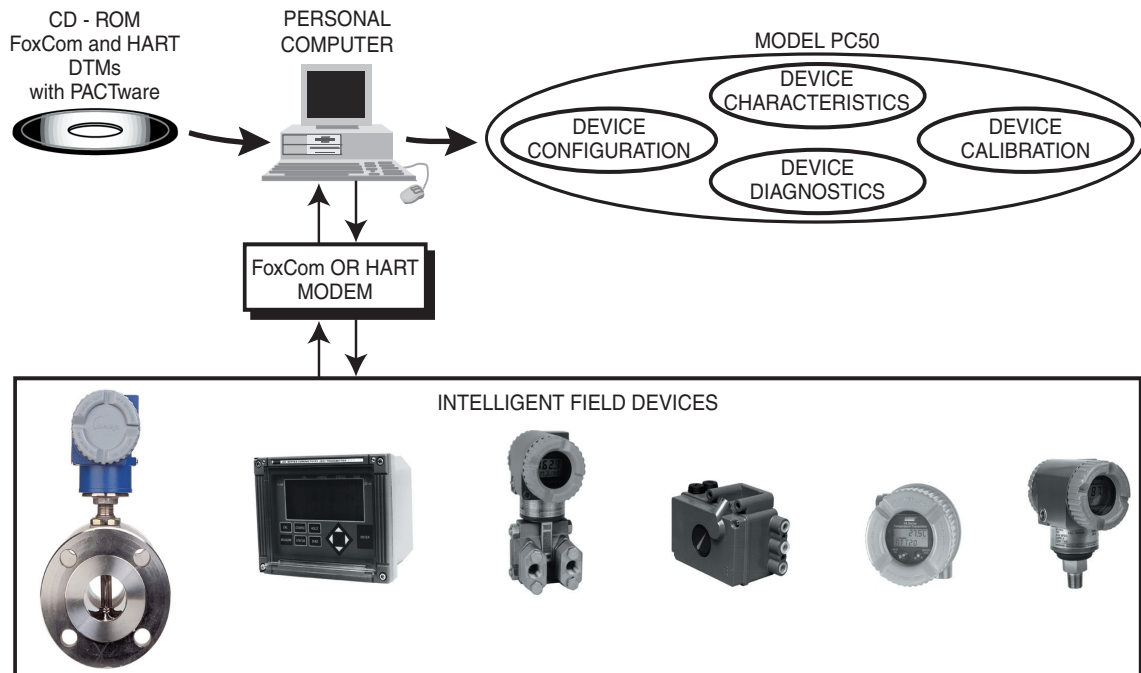


Model PC50 Field Device Tool (FDT) for Use with Intelligent Field Devices



The Foxboro[®] Model PC50 Field Device Tool is a powerful Windows 7, Windows XP⁽¹⁾, and Windows Vista based software and hardware package with external modem(s) that provides for intelligent field device life cycle management. It is also designed for open interface and provides bidirectional communication with devices having HART, FoxCom, FOUNDATION Fieldbus, or Profibus communication protocol.

FEATURES

- ▶ The Model PC50 supports Foxboro intelligent transmitters and positioners and is also an open tool for integration with third party Device Type Managers (DTMs).
- ▶ End users have freedom of choice in their selection of field devices from multiple vendors.
- ▶ Other protocols supported by FDT technology.
- ▶ Device configuration, device calibration, device diagnostics, and device characteristics.
- ▶ The Model PC50 Field Device Tool conforms to FDT Specification 1.2.1 which provides a standard mechanism for communication between applications and devices.
- ▶ Maintenance of device parameter databases is done through applications specific to each vendor's DTMs.
- ▶ Universal engineering environment to access intelligent device information.
- ▶ Expands utility of existing device engineering, and provides greater opportunity to differentiate device application.

1. The software has been tested and validated on the Windows XP operating system.

- ▶ Automatic software installation and easy software upgrades via internet.
- ▶ Capability to reconfigure, copy, clone, upload, download, and print out device databases.
- ▶ Provides device information necessary for an Asset Management System.

GENERAL DESCRIPTION

The Model PC50 FDT is a powerful Windows-based software and hardware package that provides for intelligent field device life cycle management, open interface, and bidirectional communications with the family of Foxboro and Foxboro-Eckardt I/A Series® Intelligent field devices, as well as other vendors' field devices. See Table 2 for a listing of Foxboro and Foxboro-Eckardt devices, and the communication protocol supported with each device.

Where supported in intelligent field devices by vendors' DTMs, the PC50 software in conjunction with a FoxCom or HART modem allows you to:

- ▶ Save, display or print the database.
- ▶ View full screen displays to speed off-line configuration.
- ▶ Reconfigure the tag number, tag name, device name, location, upper and lower range values, damping time, digital or 4 to 20 mA output, type of units measured, and other configurable parameters, as required.
- ▶ Accurately rerange without the need of applying a calibrated input signal.
- ▶ Diagnose problems and determine if it is a process or device error.
- ▶ Adjust the device output to any value for verification, troubleshooting, or loop calibration.

This package provides an ideal means of preconfiguring intelligent field devices. Once the databases have been preconfigured, they can be easily downloaded from a personal computer to the device after installation. Downloading can be performed either in the field or from a remote location such as the control room.

NETWORKED FIELD DEVICE TOOL ALSO AVAILABLE

A functionally equivalent software package which is a component of an I/A Series system is available. Refer to PSS 21S-8A5 B3 and PSS 21S-8A8 B3, "Overview of Configuration and Maintenance Capabilities for HART and FoxCom Devices," and "Extended Frame Services for HART and FoxCom Devices," respectively.

SYSTEM OPERATION

The system relies on vendor-created device definitions (DTMs - Device Type Managers). For Foxboro and Foxboro-Eckardt devices with FoxCom or HART protocol, DTMs are provided as configurable software on a CD-ROM. When using non-Foxboro devices with HART protocol, the device manufacturer, who has specific knowledge of device characteristics, can convert existing HART DDs into DTMs, or develop new DTMs, and provide them to the user.

The PC50 CD-ROM includes:

- ▶ PACTware Frame Application
- ▶ DTMs
- ▶ Communication DTMs
- ▶ Instructions

PACTware (Process Automation Configuration Tool) is a program designed to combine communication-capable field devices of different manufacturers. In accordance with FDT Specification 1.2.1, PACTware is used as a frame application for DTMs. The frame provides the navigation tree, menu structure, device storage, and instrument database storage. DTMs, as stated earlier, are provided by the field device manufacturer as configuration software.

DTMs will:

- ▶ Allow configuration of the device
- ▶ Communicate device health
- ▶ Perform device diagnostics, where supported by manufacturer specific device DTMs
- ▶ Allow calibration of the device, as supported by manufacturer specific DTMs
- ▶ Support FDT interfaces providing parameter information and access using XML files

A Communication DTM provides the field connectivity needed by a device DTM. Support for connectivity is provided through a FoxCom or HART modem. Refer to the Functional Block Diagrams section for figures showing the interrelationship between the optional power supply, field device, modem, PACWare and DTM CD-ROM, and PC.

OPTIONAL MODEM AND POWER SUPPLY

A modem is required for communication between the intelligent field device and the FDT software installed in the PC. An optional FoxCom Modem Kit or HART USB Modem Assembly is offered for a user who may not already have one installed. Also, an optional power supply is offered for users who need to power the device. See Table 1 for FoxCom and HART Modem specifications.

Because the modem uses the field-proven Frequency Shift Keying (FSK) technique, the transmitter output signal or positioner set point is not disturbed during communication between computer and field device.

EXTENDED FRAME SERVICES – REFERENCE

Extended Frame Services (EFS) provides field device data collection services to provide an instrument information link to enterprise asset management software. EFS scans HART and FoxCom devices for configuration and dynamic data, storing it in a relational database with a standard schema. See PSS 21S-8A8 B3.

Table 1. FoxCom and HART Modem Specifications (a)

Parameter	FoxCom Modem	HART Modem
Power Supply	Modem is powered directly by the USB port of the computer.	
Product Safety	This product is CE approved according to EMC Directive 89/336/EEC guidelines.	
Agency Certification	Modem has been designed for use in nonhazardous (general purpose) locations.	
Isolation	RS-232 interface galvanically isolated from the measurement/control loop. 1500 V dc between the device and the computer.	
Operating Temperature Limits	-40 and +50°C (-40 and +122°F)	0 and 50°C (32 and 122°F)
Storage Temperature Limits	-40 and +70°C (-40 and +158°F)	-40 and +85°C (-40 and +185°F)
Relative Humidity Limits	5 and 99% noncondensing	0 and 95% noncondensing
Computer Connection	Refer to Figure 2, and also to Option -D in the Specifications section.	Refer to Figure 3, and also to Options -H and -T in the Specifications section.
Dimensions	81 x 61 x 25 mm (3.2 x 2.4 x 1 in)	75 x 33 x 15 mm (3.0 x 1.3 x 0.6 in)

a. A modem with a USB-to-Serial (DB9) Adapter Cable is required with the Model PC50. Refer to Model Code for Modems offered.

**Table 2. FoxCom and HART Protocol Devices
(DTMs supplied on PC50 CD)**

Communication Protocol	Device Type (a)	Device Series
HART (Foxboro Devices or Foxboro-Eckardt Devices)	Pressure Transmitter (b)	130, 140, TSV175
	Pressure Transmitter	IAP10, IAP20, IGP10, IGP20, IGP25, IGP50, IDP10, IDP25, and IDP50
	Multivariable Transmitter	IMV25 (d)(e), IMV30 (d), and IMV31 (d)
	Temperature Transmitter	RTT15, RTT20, RTT80, and T1120 (b)
	Magnetic Flow Transmitter	IMT25, IMT25L, and IMT96
	Mass Flow Transmitter	CFT30, CFT50, and CFT51
	Vortex Flow Transmitter	83F, 83S, 83W, 84F, 84S, and 84W
	Buoyancy Transmitter (b)	130 and 140/240
	Electrochemical Analyzer	875CR, 875EC, 875PH, 876CR, 876EC, 876PH
	Positioner (b)	SRD960 and SRD991
HART (c)	Miscellaneous Devices	Non Foxboro Devices (c)
FoxCom (Foxboro Devices or Foxboro-Eckardt Devices)	Pressure Transmitter	IAP10, IAP20, IGP10, IGP20, IGP25, IGP50, IDP10, IDP25, and IDP50
	Temperature Transmitter	RTT20
	Magnetic Flow Transmitter	IMT25, IMT25L, and IMT96
	Vortex Flow Transmitter	83F, 83S, and 83W
	Buoyancy Transmitter (b)	130 and 140/240
	Electrochemical Transmitter	870ITEC, 870ITCR, and 870ITPH
	Positioner (b)	SRD960 and SRD991
FOUNDATION Fieldbus (Foxboro-Eckardt Devices)	Positioner (b)(g)	SRD960 and SRD961
Profibus (Foxboro-Eckardt Devices)	Positioner (b)(g)	SRD960 and SRD961

(a) Foxboro devices unless otherwise noted.

(b) Foxboro-Eckardt devices.

(c) DTMs for non-Foxboro devices to be created by the device manufacturer.

(d) PCMV Configurator Software required for configuration of Models IMV25, -D, -T, and IMV30-D, -T.

(e) PCMM Configurator Software required for configuration of Model IMV25-M.

(f) Models HHT50, PC50, or HART Communicator required for configurations of IMV31-T.

(g) In addition to HART and FoxCom, the Foxboro-Eckardt positioners are also offered with FOUNDATION Fieldbus or Profibus protocols. Contact Global Customer Support for use of the PC50 with these protocols.

SPECIFICATIONS

Workstation Requirements

- ▶ Operating System
 - Windows 7, Windows XP or Windows Vista
- ▶ 200 MB hard disk memory
- ▶ 512 MB of memory
- ▶ Microsoft compatible mouse or an equivalent pointing device
- ▶ RS-232 Serial Port (COM1 – COM4)
- ▶ Printer Interface
- ▶ CD-ROM Drive

Remote Communications

The computer communicates bidirectionally with the intelligent field device through the modem and field wiring. Information that can be displayed includes:

- ▶ Device Tag
- ▶ Measurement Values
- ▶ Database
- ▶ Status and Diagnostics
- ▶ Device Temperature
- ▶ PID Control and Diagnostic Parameters of Positioners and Valves

In addition, the information that can be displayed or reconfigured (depending on the intelligent field device's DTM) includes:

- ▶ 4 to 20 mA Output Signal in mA, Percent of Span, or Measurement Value in User-Selectable Engineering Units (EGUs)
- ▶ Plant EGUs
- ▶ Digital Output in User-Selectable EGUs
- ▶ Zero and Span
- ▶ Elevation or Suppression (4 to 20 mA output signal only)
- ▶ Linear or Square Root Output
- ▶ Electronic Damping
- ▶ Failsafe Direction
- ▶ Alarm Parameter Levels
- ▶ Sensor Curve Type (Temperature)
- ▶ Line Size and Meter Factor (Flow)
- ▶ Pulse Output Parameter

- ▶ Device Name, Tag Number, Tag Name
- ▶ Device Location
- ▶ Calibrator's Initials
- ▶ Last Calibration Date

Optional Parts Provided with Each PC50

For users who do not have an existing FoxCom or HART Modem, or require a power supply to power the intelligent field device, the following optional parts can be provided (also see Model Code):

OPTION -C: POWER SUPPLY FOR FIELD DEVICE

This option comprises the items listed below.

- ▶ 120 V ac, 60 Hz Power Supply
- ▶ 120 V ac to 24 V dc Converter
- ▶ A 5-foot cable assembly with 2-banana plugs on one end and plug-type BNC connector on the other end.
- ▶ Two Test Clips (mini-grabbers).

OPTION -D: FoxCom MODEM KIT

This option comprises the items listed below.

- ▶ FoxCom Modem
- ▶ Cable assembly with 9-pin RS-232 connectors (1 foot and 5 foot long).
- ▶ A 5-foot FoxCom cable with two banana plugs on one end, and a plug-type BNC connector on the other end.
- ▶ Two Test Clips (mini-grabbers)
- ▶ Velcro Strips with integral loops and hooks for attaching modem to computer.

OPTION -H: HART USB MODEM ASSEMBLY

This option comprises the items listed below.

- ▶ HART Modem Assembly with integral 6-inch USB connector cable on one end, and integral 6-foot connector cable with two attached banana plugs on the other end.
- ▶ Two Test Clips (mini-grabbers)

OPTION -T: HART MODEM KIT

This option comprises the items listed below.

- ▶ HART Modem Assembly with integral USB connector on one end, and integral 6-foot connector cable with two attached banana plugs on the other end.
- ▶ Two Test Clips (mini-grabbers)

OPTION -U: USB-to-SERIAL ADAPTER CABLE

This option provides a 1-foot cable with a Type A, USB plug-type connector on one end, and a 9-pin serial plug-type connector on the other end.

FUNCTIONAL BLOCK DIAGRAMS

(see Figures 1, 2, and 3)

Figure 1. System Functional Block Diagram

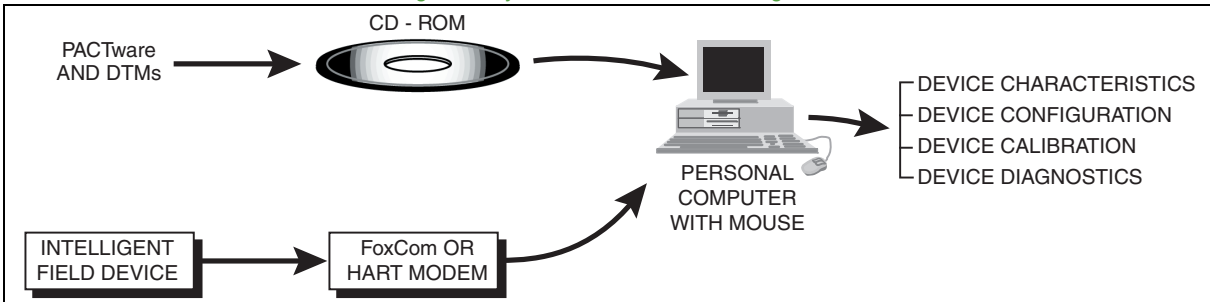


Figure 2. Functional Block Diagram with FoxCom Modem, with Optional and User Power Supply

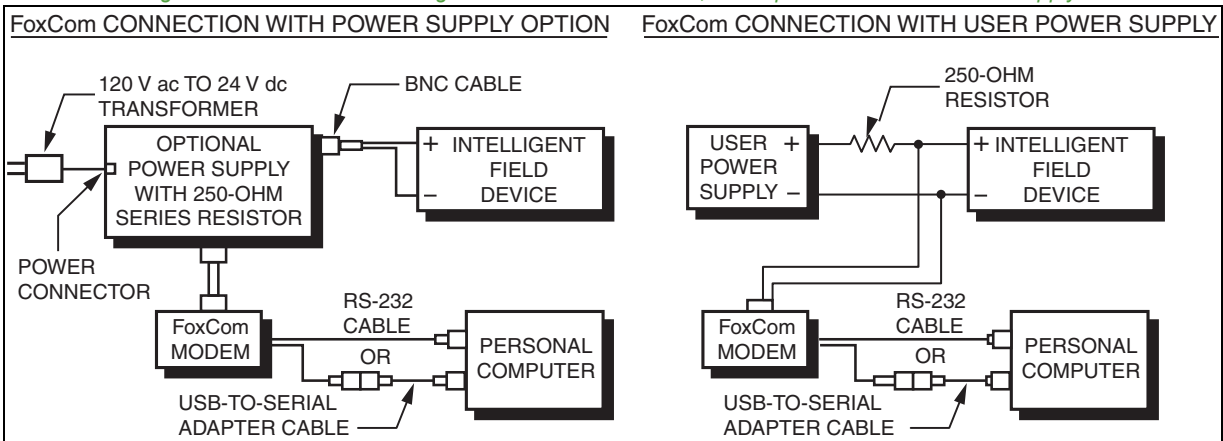
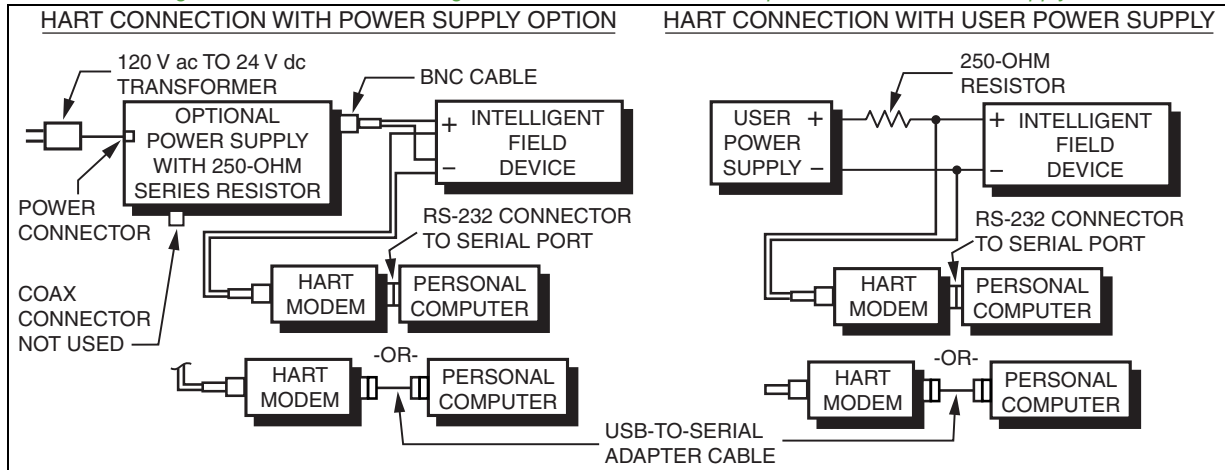


Figure 3. Functional Block Diagram with HART Modem, with Optional and User Power Supply



SAMPLE SCREENS

Figure 4 through Figure 8 are sample screens available with the Model PC50. The sample screens shown are for Foxboro pressure transmitters with FoxCom or HART communication protocol, as applicable.

Figure 4. Sample Device Overview Screen

HART		Device Information	
Tag	TAG	Date of Last Calibration	10/11/2002
Descriptor	DESCRIPTOR	Firmware Version	4.050
Message	MESSAGE	Device ID	8726540
Polling Address	0		

PV	
Value	PV as % of Span
100.00	100.00
75.00	75.00
50.00	50.00
25.00	25.00
0.00	0.00
0.00 inH2O	0.00%

PV Analog Output	4.02	mA
PV LRV	0.00	inH2O
PV URV	100.00	inH2O

OK Cancel Apply

Figure 5. Sample Device Status Screen

The screenshot shows a 'Device Status' window with two columns of error indicators, each with a checked green box. The left column includes: Diagnostic Error, Re-Init Needed, Device Busy, Offline Mode, Calibrate Mode, Local Mode, Status 1 Map Error, and Status 2 Map Error. The right column includes: Input 1 Range Error, Input 2 Range Error, Input 3 Range Error, Input 4 Range Error, Analog Output Saturated, Output Current Fixed, Communications Error, and EE Programming Error. Below the list is an 'Error Reason' text box. At the bottom right are 'OK', 'Cancel', and 'Apply' buttons.

Figure 6. Sample Device Configuration

The screenshot shows a 'general' configuration window. It contains the following fields: 'Tag' with the value 'TAG'; 'PV LRV' with the value '0.00' and unit 'inH2O'; 'PV URV' with the value '100.00' and unit 'inH2O'; 'Damping' with a dropdown menu set to '1' and unit 'seconds'; and 'PV Mode' with a dropdown menu set to 'Linear'. A note next to the PV Mode dropdown reads: 'Note: Square root mode should only be used for DP instru...'. At the bottom right are 'OK', 'Cancel', and 'Apply' buttons.

Figure 7. Sample HART Status Screen

The screenshot shows a window titled "HART Status" with two main sections: "Hart Status" and "Field Device Status".

Hart Status:

- mA is in active range.
- SV is in active range.
- TV is in active range.
- QV is in active range.

Field Device Status:

- Primary Value Out Of Limits
- Non-Primary Value Out Of Limits
- Analog Output Saturated
- Analog Output Fixed
- Cold Start
- Configuration Changed (Warning icon)
- Field Device Malfunction

Buttons at the bottom: OK, Cancel, Apply.

Figure 8. Sample Device Process Variables Screen

The screenshot shows a window titled "Process Variables" with several input fields and units:

- Primary Variable: inH20
- PV % Span: %
- SV: inH20
- TV: degC
- 4V: degC
- PV Analog Output: mA
- PV LRV: inH20
- PV URV: inH20
- PV LRL: inH20
- PV URL: inH20
- PV Minimum Span: inH20

Buttons at the bottom: OK, Cancel, Apply.

MODEL CODE

Description	Model
Intelligent Field Device Tool (FDT)	PC50
Communication Protocol FoxCom and HART Communication Protocol (Both FoxCom and HART DTMs on the same CD-ROM)	-B
Language English	E
Additional Software Not Applicable	0
Optional Selections FoxCom Modem Kit (a) HART Modem Kit HART USB Modem Assembly (a) Power Supply for Field Device (b) USB-to-Serial (DB9) Adapter Cable (c)	-D -T -H -C -U
Example: PC50-BE0-DCU	

- a. Refer to Table 2 for FoxCom and HART Modem specifications.
- b. Power supply for field device is a 120 V ac 60 Hz-to-24 V dc converter; it cannot be used with ac line powered devices (e.g. Mass and Magnetic Flow Devices).
- c. Allows PC50 to communicate via USB port to serial modem. Note that this adapter has been successfully tested with Foxboro devices. Other brands of adapter cables may not support communications between the PC50 and Foxboro serial modems. Option -U is also available as a separate part by specifying Foxboro Part Number D0186XC.

For configuration information, refer to *Intelligent Field Device Configurator IFDC for use with I/A Series Systems (B0700EU)*.

ORDERING INSTRUCTIONS

1. Model Number
2. Tag and Application

OTHER FOXBORO PRODUCTS

The Foxboro product lines offer a broad range of measurement and instrument products, including solutions for pressure, flow, analytical, temperature, positioning, controlling, and recording. For a list of these offerings, visit our web site at:

www.fielddevices.foxboro.com