

OpenField™ Honeywell's FOUNDATION fieldbus solution



FOUNDATION fieldbus is the worldwide standard, supported by all the major industrial instrument suppliers, for high-speed digital communications in measurement and control applications. This supports multidrop connections to field devices with power and signal on the same wire pair even in an intrinsically safe environment.

OpenField builds on FOUNDATION fieldbus to provide an unparalleled integrated portfolio of system platforms, field devices, tools, interfaces and advanced control applications to maximise the benefits enabled by fieldbus.

Recognised fieldbus benefits

With the experience of 10 years of digitally integrating Smartline transmitters into TPS systems and the multitude of fieldbus trials and tests over the last 8 years end users have verified that fieldbus offers valuable benefits:

- Reduced installation cost - field wiring and termination savings of 50 to 90% depending on the number of multidrop devices.
- Reduced commissioning cost – up to 80% savings in field device configuration, checkout and start-up due to remote communications, remote diagnostics, cut and paste digital techniques for configuration etc.

- Reduced on-going maintenance costs – typically 30% savings with remote diagnostics, save/ restore replacement device configuration etc.
- Flexibility to include advanced functionality in field devices – multivariable data from single devices, PID control in devices etc.
- Competitive interoperable equipment from preferred suppliers – ensuring a complete fieldbus solution with the ability to mix and match or replace different supplier's equipment.

Added OpenField benefits

OpenField extends the above-recognised benefits to ensure a user-friendly approach, which truly maximises the value of fieldbus: -

- Reduced field device software maintenance costs of up to 70% by downloading software revisions and enhancements over the fieldbus connection. This replaces manual replacement of fragile PROMs in a field environment.
- Secure consistent control availability in the field devices with selectable ideal or robust PID control and the system links to ensure correct handling of mode changes, limit conditions and power failures.

- Improved control performance with faster loop control of 4 – 8 times per second when needed.
- Reduced loop downtime with redundant Link Master/ Link Active Scheduler available in the field devices to keep the fieldbus operating even with the primary master disconnected or out of operation.
- Fewer plant shutdowns and reduced instrument downtime by managing fieldbus data in Honeywell's asset maximising software.

Only OpenField provides these added fieldbus benefits!

The OpenField program extends these advanced functionality's into other supplier's equipment with licensed suppliers able to adopt the quick availability track of linking in the generic OpenField round card hardware or follow the lower competitive cost Do-it-Yourself OpenField developers kit path. The Flowsolve Valtek Logix 1400 positioner is the first of these other supplier OpenField devices to be registered as interoperable by the Fieldbus Foundation and the portfolio is being steadily increased.

OpenField Devices

For pressure, level and flow applications the full ST 3000, Smart pressure transmitter range are registered by the Fieldbus Foundation and included in the

OpenField portfolio together with the model STT35F Smart temperature transmitter. All of these field devices share exactly the same solution approach of including the flash memory for software revision, robust or ideal PID control algorithm, redundant LAS functionality, fast speed of operation and with links included to support advanced control co-ordination with the host system.

OpenField Host system

To obtain maximum benefit from these features the preferred host system should either be the Honeywell Plantscape or world leader TPS system. This not only ensures full functionality but also provides advanced configuration tools and operator displays for safe, consistent fieldbus implementation. OpenField devices are effectively "double registered", in that they are not only Fieldbus Foundation registered but also registered as fully functional with the OpenField host.

Other supplier's host system

When used with other supplier's hosts the functionality may vary as there are no Fieldbus Foundation interoperability tests or registration processes for hosts. Should another suppliers' host system be preferred, Honeywell's OpenField devices are still superior to competitors' devices but to take maximum advantage the host :-

- should be able to operate with a redundant LAS in the field device,
- should be capable of allowing devices to operate at 8 updates per second,
- should support software revision over the fieldbus connection
- enable acceptance of the manufacturer specific Device Description

- This Device Description is available on a diskette supplied with the device and describes the added functionality i.e. beyond the Fieldbus Foundation standard definition.

For example if the meter body temperature of a pressure transmitter is to be available as a secondary variable for freeze protection, the device description requires to be included in the host system.

Fieldbus protocol Layers.

FOUNDATION fieldbus consists of 3 layers :-

Physical Layer which is defined in IEC 61158-2 (1993) and describes the communication media, baud rate, number of devices etc.

Communications « Stack » which defines the transmission of messages through a deterministic centralised bus scheduler called the Link Active Scheduler (LAS) in a publish/ subscribe manner.

User Application Layer which defines the grouping of data into user friendly packages, or blocks, to enable control applications to be built up by sharing of data.

User Application - Blocks

Fieldbus devices have all their configuration and operational data compartmentalised into blocks defined by the Fieldbus Foundation. The **Resource Block** contains the data describing the characteristics such as serial number, manufacturer and device name. There is only one resource block in a device.

Transducer Blocks contain information such as sensor type and calibration data to enable processing inputs and outputs for standard use by the function blocks. Several transducer blocks can reside in a single device.

There are 29 defined **Function Blocks** which can be included in devices to provide the required functionality. Examples of these are Analogue Input , Digital Output, PID control algorithm, Control Selector and Manual Loader function Blocks. These are linked together to operate as control loops. Data transfers are executed to a precise deterministic schedule with spare time allowed for non periodic messaging over the fieldbus.

Conclusion

Fieldbus is a very important enabling technology. It represents a major change in designing, implementing, operating and maintaining measurement and control operations. Choose FOUNDATION fieldbus as the best fieldbus technology. Choose OpenField as the best fieldbus solution.

More about FOUNDATION fieldbus

For those wishing to know more about FOUNDATION fieldbus, whether it be more technical data, how to implement intrinsic safety, how to install multidrop wiring, number of devices on a bus or maximum length of wiring etc., take a look at the Internet site "www.fieldbus.org" for a wealth of data. A list of registered products is maintained, online technical documents are readily available for download, press releases are published and a complete list of available documents is included.

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