	Technical Note	16/11/2011
	HART Communications Protocol Document Reference: FSIR006	

Product: IRmax IR Hydrocarbon Gas Detector

Subject: HART Communications



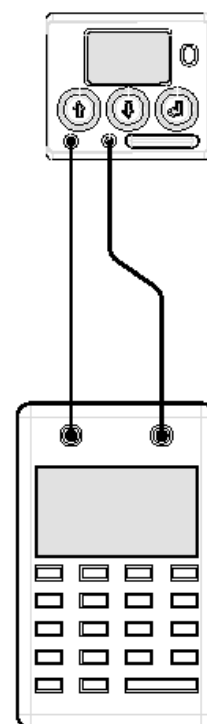
The HART (Highway Addressable Remote Transducer) Protocol is the global standard for sending and receiving digital information across analog wires between smart devices and control or monitoring systems.

More specifically, HART is a bi-directional communication protocol that provides data access between intelligent field instruments (gas detectors, level gauges, pressure transmitters etc) and host systems. A host can be any software application from technician's hand-held device or laptop to a plant's process control, asset management, safety or other system using any control platform.


HART communications is available as an option on IRmax for local and/or remote diagnostic interrogation. Both the main IRmax detector and the IR Display accessory can be supplied with a HART modem as an option.

Local HART: hand-held HART communicator connection. Industry-standard HART communicators are used on industrial sites for maintaining and calibrating a host of instruments. The key benefit of HART is site maintenance staff can use a common communicator to maintain all of their safety and process instruments. The user simply needs to upload the DD (Device Description) file to their communicator to enable the following IRmax functions:

- Gas concentration display
- Obscuration level display
- Supply voltage display
- Output signal trim and ramp
- Instrument inhibit
- Zero & Calibration
- Detector serial number display
- Software version display
- Display and change HART password
- Read and adjust alarm thresholds (IR Display Red LED)
- Displays detailed status/fault information.

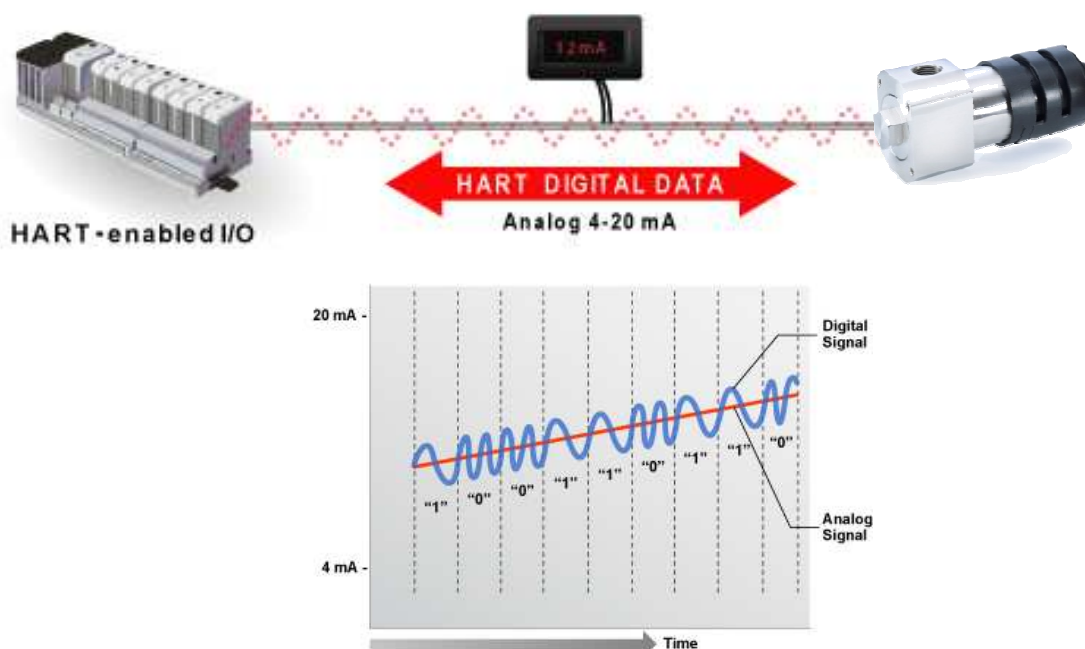


Full details of available information can be found in the HART documents referenced at the end of this technical note.

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Hand-held HART configurator connection is made via the IR Display using clips to connect to the I.S. pins located on the front of the display module (see diagram). *Only IRmax detectors fitted with a Fixed IR Display or Remote IR Display are HART hand-held communicator compatible.*


HART over 4-20mA: the HART protocol is super-imposed over the IRmax detector 4-20mA signal to provide the same data as listed on the previous page. In this mode of operation the safety function is performed by the 4-20mA signal (connected to a conventional controller or PLC/DCS). A HART device can then also be connected in parallel with the signal connections to read the IRmax detector status information. HART devices include hand-held communicators, a PLC with HART connectivity or a PC-based Asset Management System (AMS) communicating via a HART modem.



Further information on HART can be found on the HART Communications Foundation website:

www.hartcomm.org

Specifying the correct detector: the IRmax price list details all of the options available and a simple part numbering structure enables the exact detector specification to be identified. HART enabled IRmax can be supplied in the configurations shown in the following table.

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Detector Configuration	HART over 4-20	Local HART	Comments
IRmax Basic with HART over 4-20.	✓	✗	An IR Display cannot be used with IRmax Basic.
IRmax with Fixed IR Display and HART over 4-20.	✓	✗	A HART modem is fitted to the IRmax detector only; not the IR Display accessory.
IRmax with Fixed IR Display and Local HART.	✗	✓	A HART modem is fitted to the IR Display accessory only; not the IRmax detector.
IRmax with Fixed IR Display, HART over 4-20 and Local HART.	✓	✓	HART modems are fitted to both IRmax and IR Display.
IRmax with I.S. Barrier Module and HART over 4-20.	✓	✓	A remote or hand-held IR Display accessory may be used. The remote IR Display is available with or without a Local HART modem.

Accessing and using HART information: every HART enabled instrument requires a unique Device Description (DD) software file to enable HART communicators to interface correctly. The DD file must be copied into the HART communicator operated by each user. HART communicators can store several DD files enabling connection to a wide range of instruments.

There are two DD files for IRmax: one for the IRmax detector, one for the IR Display accessory. Detailed HART documents are available describing connection requirements and all of the data available for uploading from the detector. The DD files and HART documents are available for customers to download from the crowconsupport website (www.crowconsupport.com). The DD files are also in the process of being uploaded to the HART Communications Foundation website (www.hartcomm.org).

HART over 4-20: HART document: GLC-070X
DD File: 006031/e0dc

Local HART: HART document: GLC-046X
DD File: 006031/e0dd

Note: IRmax is also available with RS-485 Modbus communications (described separately in technical note FSIR007). A detector may be supplied with HART or Modbus; not both.