



Special Features

- Suitable for a wide range of meters
- Load-free sensor detecting the pointer's rotation
- Protected against external magnetic fields
- May be retrofitted to pre-equipped meters
- Detects flow direction
- Contact bounce suppression
- Self-diagnostics
- 10-year battery life
- Hermetically-sealed housing (IP68)

Description

HRI is an universal sensor, which is compatible with a wide range of meters, including single-jet, multi-jet and piston meters with dry-dial and semi-dry registers. HRI can be retrofitted to all meters equipped with a metal plate on the pointer without breaking the meter seal.

HRI is available in two versions. The **HRI PulseUnit** is a high-resolution pulser, which detects the flow direction. The **HRI DataUnit** is an electronic register with a data interface, which supports both hard-wired M-Bus systems and battery-driven MiniBus devices such as mobile meter reading systems.

The HRI is more than an extension of a simple sensor. It has been expanded to provide a reliable data source for remote reading of a conventional meter. It is the interface for all today's requirements for data interrogation and remote transmission.

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Applications

Route-planned meter reading for billing, for example mobile reading systems.

Load profiles via a fixed network using M-Bus or via radio, telephone or GSM Modem.

Industrial application e.g. dosing.

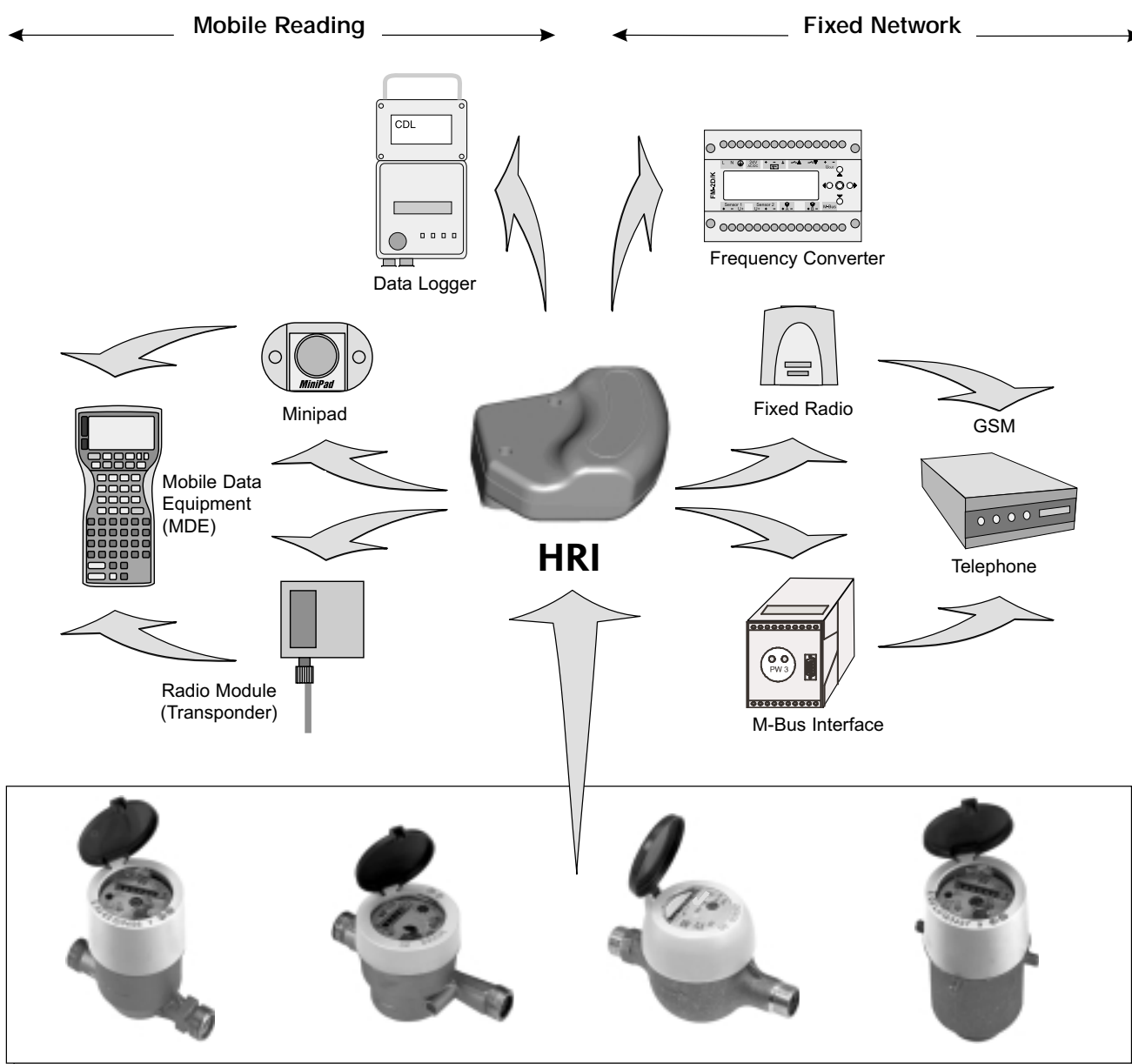
Remote reading of flow rate and cumulative flow using a frequency converter.

Leakage detection when connected to a data logger.

Generation and transmission of flow profiles using a data logger and GSM modem.

The design of the HRI allows the system to be installed in extreme conditions, such as flooded meter pits.

System Overview



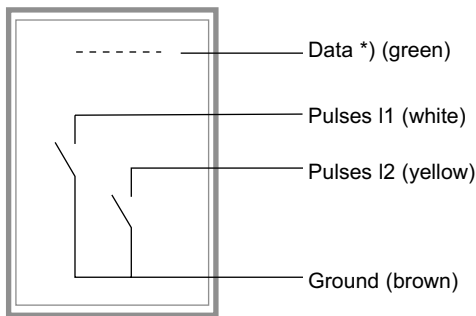
Technical Data

Cable length 1.5 m

Operational cable length: several km with transient voltage protection

2 pulse outputs (I1, I2)
according to ISO / TC 30 / SC 7 / WG 8 draft paper

- Voltage input: max. 24 V
- Current input: max. 20 mA
- Power input: max. 0,48 VA
- Internal resistance: 100 Ohm
- Max. output frequency: 5 Hz; 32 ms pulse width
- Memory for up to 1.000.000 reverse pulses



*) active for HRI DataUnit only

Data interface (DATA)

- M-Bus and MiniBus (Auto speed detection)
- Protocol according to IEC 870 / EN 1434-3
- Data: counter reading, meter number

External power supply via DATA line
possible: 5 to 24 V DC

Counter reading and settings are retained in case of power failure

Temperature range

- Storage: -20° to +65° C
- Operation: -10° to +65° C

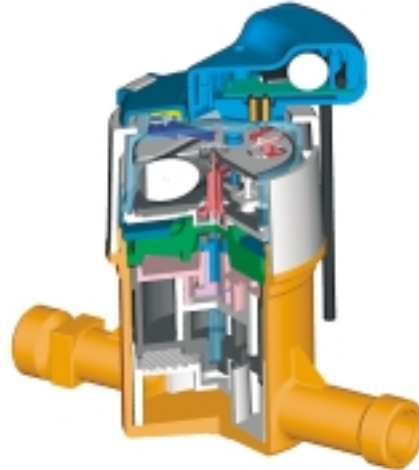
Divisor

The pulse Divisor D is the relationship between the rotational frequency of the scanned pointer and the output pulses:

$D = \text{Number of litres per pointer rotation} \div \text{number of litres per output pulse}$

- Possible values for D: 1 / 2,5 / 5 / 10 / 25 / 50 / 100 / 250 / 500 or 1000
- Example for residential meters (1 litre pointer): D=1 means 1 l per pulse, D=1000 means 1 m³ per pulse, ...

Schematic



Available Designs

HRI PulseUnit

Depending on the application, the *HRI PulseUnit* can be offered in four modes: Mode A1, A2, A3 and A4.

Mode A1 (default mode)

This mode is used with readout devices with unidirectional pulse output.

Output I1: Balanced pulses

Reverse pulses are compensated by identical number of forward pulses.

Output I2: Counter status:

If output I2 is open, the reverse flow is compensated. If output I2 is closed compensation is not completed.

Mode A2

Output I1: Forward flow pulses

Output I2: Reverse flow pulses

Mode A3

Output I1: Forward and reverse flow pulses

Output I2: Flow direction

Mode A4

Output I1: Balanced pulses

Output I2: Tamper and error status

Output I2 is closed in normal operation, if the cable is cut or an other error is detected I2 is opened

HRI DataUnit

The HRI DataUnit has an interface to read out the data and subsequent configuration. It also works as a *PulseUnit*, but is programmable in the field.

Programmable settings are:

- Mode: B1, B2, B3 and B4
(corresponding to *HRI PulseUnit* modes A1, A2, A3 and A4)
- Divisor
- Meter number (8 digits)
- Counter start reading (meter reading after fitting the HRI)

Order Information

HRI PulseUnit

Mode and Divisor are factory-set according to customer's specification.

- Default setting*: Mode A1, Divisor = 1

HRI DataUnit

All settings are programmable in the field.

- Default setting*:

Mode	= B1,
Divisor	= 1,
Meter number	= HRI production number,
Counter start	= 0,
Unit	= l

* Please specify, when ordering, if settings are to be different from the above.

HRI program tool

Used to program and test the readout of the *HRI DataUnit* with a PC.

The tool includes:

- MiniPad and MDK-PC to connect the *HRI DataUnit* with a PC,
- MiniCom PC software to program and read out the *HRI DataUnit*.

For details of accessories such as readout devices (e.g. Inductive Meter Reading System), software (e.g. DOKOM Mobil) etc. please see separate leaflets.

Scope of Delivery

