HRI

A comprehensive pulse and data system

Special Features

Suitable for a wide range of meters

Load-free sensor detecting the pointer's rotation

May be retrofitted to pre-equipped meters

Detects flow direction

Contact bounce suppression

Self-diagnostics

More than 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 on all Sensus meters pre-equipped with an HRI modulator.

HRI is available in two versions. The **HRI PulseUnit (A-type)** is a high-resolution pulser, which detects the flow direction. The **HRI DataUnit (B-type)** 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.

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 (5 m optional)

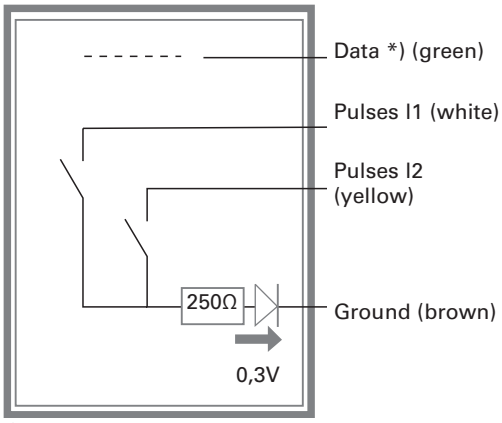
Operational cable length: several km with transient voltage protection

Temperature range

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

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

- Switched voltage: max. 24 V
- Switched current: max. 20 mA
- Power input: max. 0,48 VA
- Max. output frequency: 5 Hz; 124 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

Divisor

D= number of litres per output pulse divided by the number of litres per pointer rotation

- Possible values for D: 1 / 2.5 / 5 / 10 / 25 / 50 / 100 / 250 / 500 or 1000

- Example for residential meters:
  D=1 means 1 l per pulse,
  D=1000 means 1 m³ per pulse, ...

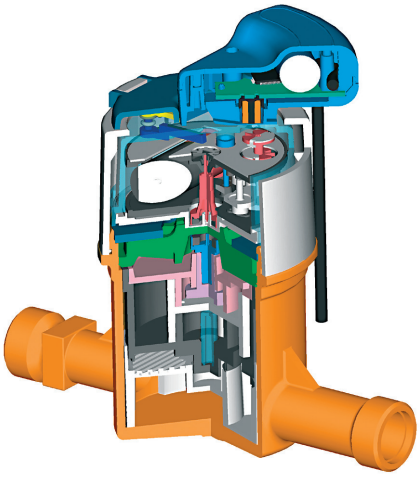
For MeiStream Encoder at the HRI-B type the right index value (Z = 100l or 1000l) has to be set correctly. For this purpose MiniCom can also be used on-site.

At the HRI-A types the pointer value Z is always set at 1 and for the MeiStream Encoder the real used pointer value has to be considered for calculation of the output pulse values.

Output pulse value = Z x D

e. g. pointer value Z Encoder = 100
pulse value HRI D = 10
→output pulse value = 100 x 10 = 1000l / 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: not used

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 (open = forward)

Mode A4

Output I1: Balanced pulses *
Output I2: Cable cut detection
Output I2 is permanently closed. If the cable is cut, it can be detected as open.

* Reverse pulses are compensated by identical number of forward pulses

HRI DataUnit

The HRI DataUnit has an interface to read out the data and subsequent configuration. As a PulseUnit it is also 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)
- **Primary Address**
- **Secondary Address**

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.

S8: Counter 8 digit (m3-resolution)

alternative

S12: Counter 12 digit (l-resolution)

S8 resp. S12 cannot be changed and is hardware related

- Default setting *:

Mode	= B1
Divisor	= 1
Meter number	= HRI production number
Counter start	= 0
Unit	= m^3

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

HRI which are pre-equipped to a Sensus Sentinel will be programmed to the meters.

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. SensusREAD) etc. please see separate leaflets.

Scope of Delivery

Data Readout

Meter ID

Meter Reading (in m^3 or l) *

* depending on the 8 or 12 digit version

Ordering Example

HRI - B1	/	D1	/ S12
Mode		Divisor	12 digit

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