

# Comments on Annex 146A „Intrinsically Safe Applications“

Geneva, 23.1.2018

## Current Wording (1/2)

Intrinsically safe systems can be based on a 10BASE-T1L PHY, if the constraints described within this annex are taken into account.

When using a PHY IC within a PHY intended for the use in intrinsically safe applications, external termination resistors, outside of the PHY IC are recommended to be able to adopt the termination resistors in accordance with the used intrinsically safe concept and to limit the energy to/from the intrinsically safe link segment in case of a failure.

This would mean, that for such applications, separate pins for the differential transmit outputs and the differential receive inputs are recommended within a PHY IC.

The differential receive inputs should be high impedance, to allow external series resistors, to limit the energy being provided from/to the receive inputs to/from the intrinsically safe link segment in case of an internal failure of the PHY IC. Further information about how to use a 10BASE-T1L PHY within intrinsically safe applications can be found in IEC 60079-0, IEC 60079-11 and other relevant national and international standards.

## Current Wording (2/2)

**This is not correct! For the given intrinsic safety concept these point are required, not only recommended!**

Intrinsically safe systems can be based on a 10BASE-T1L PHY as described within this annex are taken into account.

When using a PHY IC within a PHY intended for the use in intrinsically safe applications, external termination resistors, outside of the PHY IC are recommended to be able to adopt the termination resistors in accordance with the used intrinsically safe concept and to limit the energy to/from the intrinsically safe link segment in case of a failure.

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## Intention of this Annex

- The Annex should show how the objective „Do not preclude working within an Intrinsically Safe device and system as defined in IEC 60079“ can be achieved
- Intrinsic safety can NOT be achieved by the communication standard! But there are some parameters, which makes the realization of intrinsic safety easier or even possible:
  - Bandwidth
  - Transmit voltage
  - Etc.
  - THESE POINTS ARE CONTENT OF THE NORMATIVE PART
- In addition, the realization of the PHY-IC has a strong impact of the intrinsic safety concept:
  - Seperate pins for transmit and receive
  - External Termination Resistors
  - Etc.
  - THESE POINTS SHOULD BE CONTENT OF THE ANNEX

## Proposed Wording

The PHY described in Clause 146 does not preclude working within an intrinsically safe device and system as defined in IEC 60079.

Nevertheless the realization of the PHY IC has a strong impact on the intrinsic safety concept.

External termination resistors can be used to limit the energy to/from the intrinsically safe link segment in case of a failure. Internal termination resistors are not suitable for a current limitation according to the relevant intrinsic safety standards.

Providing separate pins for receive and transmit, external resistors for current and energy limitation can be added to a high impedance receive path.

Further information about how to use a 10BASE-T1L PHY within intrinsically safe applications may be found in IEC 60079-0, IEC 60079-11 and other relevant national and international standards.

**Thank You for Your attention**

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