HART

MUCH MORE DATA

HART can convey **more information** on the same 4-20 mA signal; using overimposed current modulation.

Smart Tx

4-20 mA loop
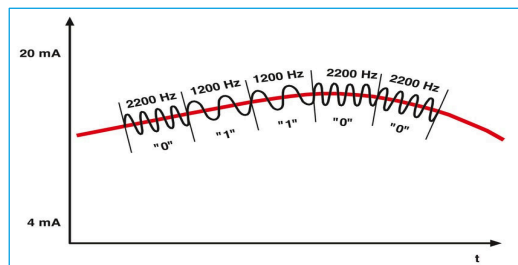
Configuration (input)
- Tc K
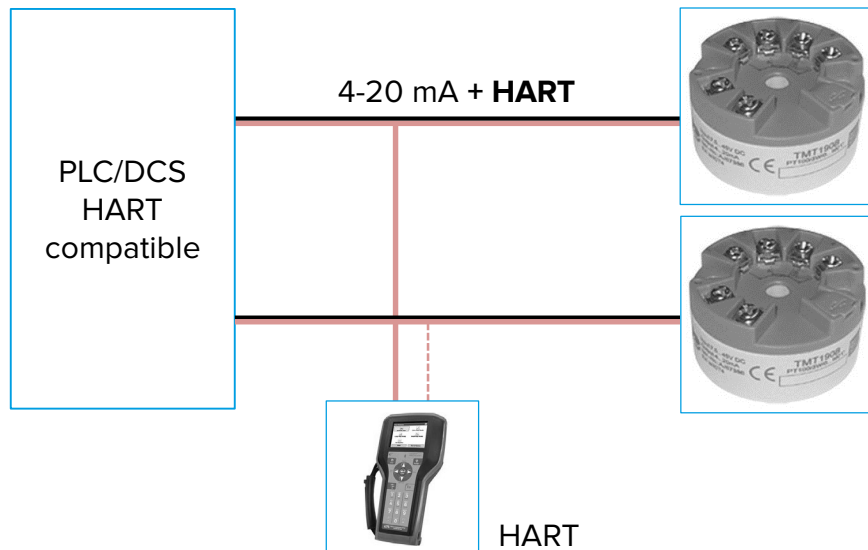- Downscale = 4 mA
- Burnout high
- ...

Monitor (output)
- Sensor temperature
- Internal temperature
- ...

Diagnostics (output)
- Output saturation
- Internal memory fault
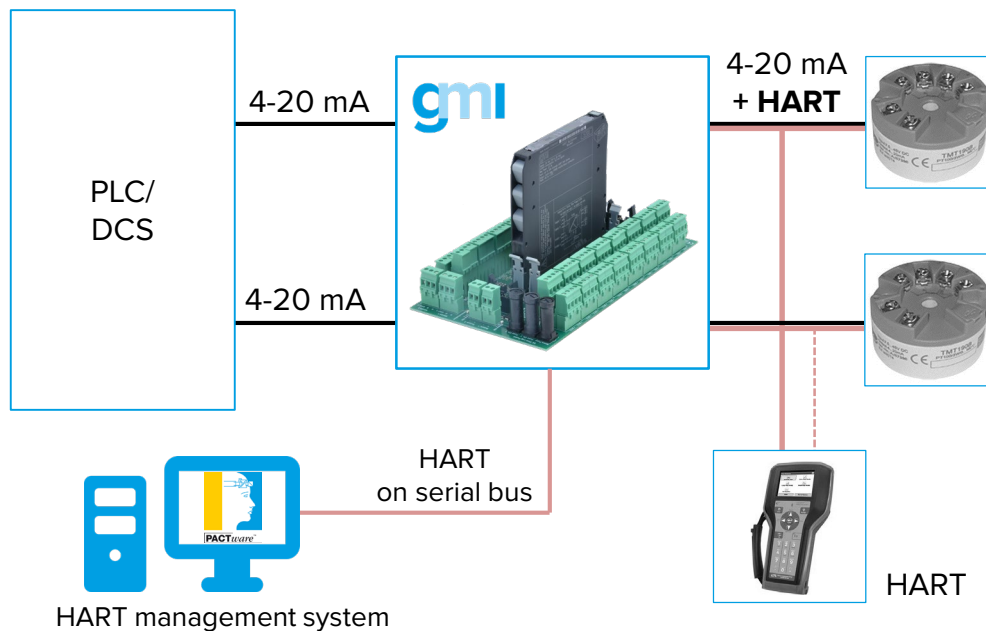- ...

HART Applications

DIRECT CONNECTION TO SYSTEM

4-20 mA + **HART**

PLC/DCS
HART
compatible

HART

Pros
- Universal

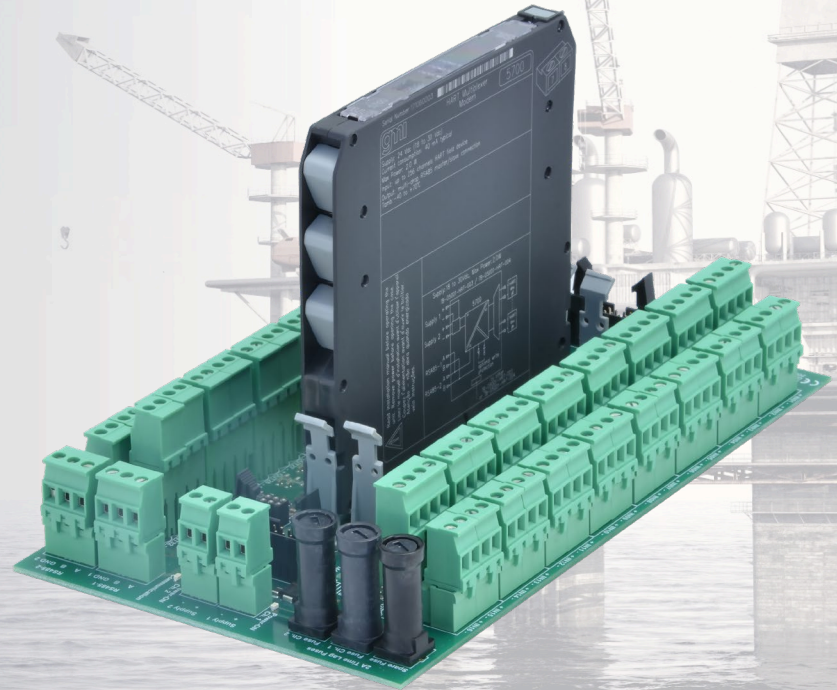**Cons**
- Impractical for large networks

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HART Applications

WITH CONNECTION TO HMS

- Universal
- Practical for large networks
- **Apply to new and old installations**

PLC/DCS

4-20 mA

4-20 mA

4-20 mA + **HART**

HART on serial bus

HART management system

HART

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GMI HART Mux
Solution

Product overview

HART Multiplexer Systems

The new **SIL 3** certified GMI HART Interface System drastically reduces the complexity and cost of HMS installations by eliminating the need to use slaves; hence, reducing by 2-4 times the number of modules required and at the same time increasing the speed (baud rate) of the system.

5700 SERIES ADVANTAGES

- **Reduced Number of components**: Each Multiplexer Module controls up to 256 Channels; only 63 Mux Modules to control a total of 16.128 channels

- **Reduced Wirings and Complexity**: Less Components, Less Cables, Less Wirings for hassle free, simplified, Design and Installation

- **Reduced Spare Parts**: Inventory and Maintenance Cost are substantially reduced

- **Increased performances**: 115.200 bps baud rate
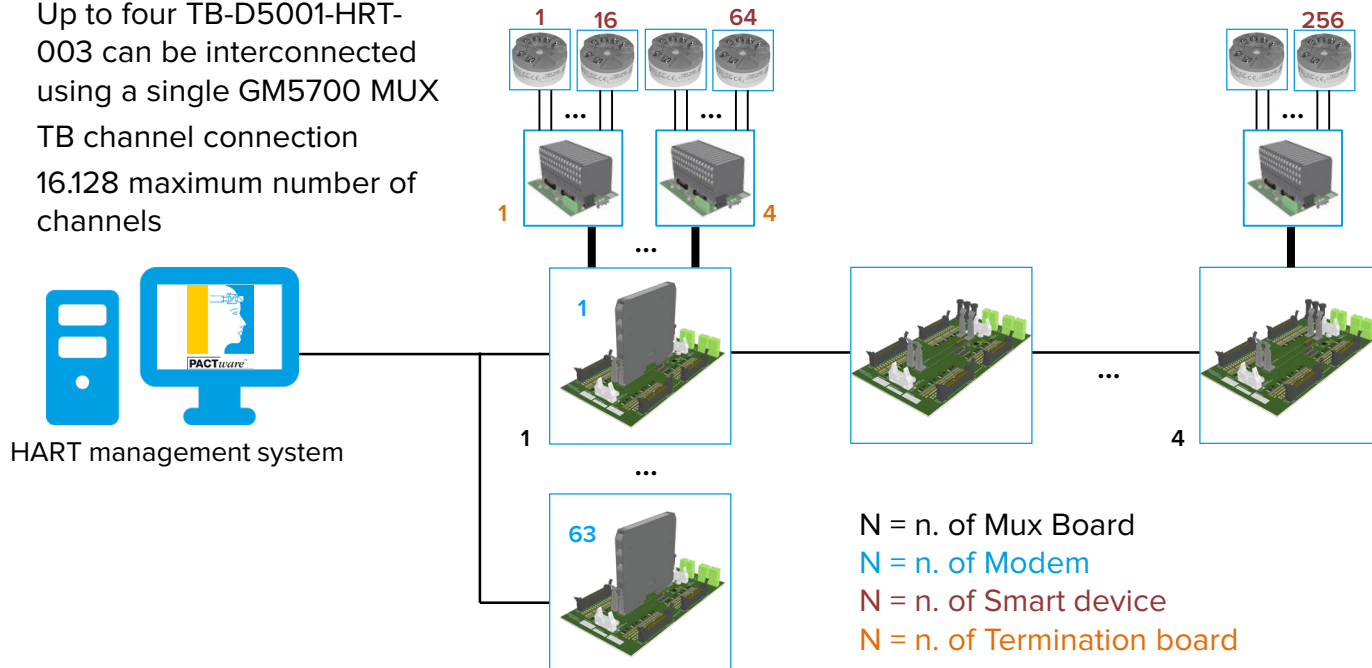
Features

UNIQUE ADVANTAGES

STRENGTHS

- Reduced foot print: High Density: 256 Channel
- Increased Architecture Ability: 63 configurable addresses
- Faster data acquisition: 115.200 Baud Speed
- Reduced wiring: Slaves are not required
- Higher Reliability In & Outdoor: Certified -40° to + 70° C
- Higher resiliance: Channel to channel isolation
- Data Guaranteed by 3rd Party: SIL 3 TÜV certification
- Current & Valid Standard: Certified IEC 61508:2010, Ed.2
- Lower Ownership Cost: Certified for 20 years operation

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TB-D5001-HRT-003 configuration

- Up to four TB-D5001-HRT-003 can be interconnected using a single GM5700 MUX
- TB channel connection
- 16.128 maximum number of channels

HART management system

N = n. of Mux Board
N = n. of Modem
N = n. of Smart device
N = n. of Termination board

14

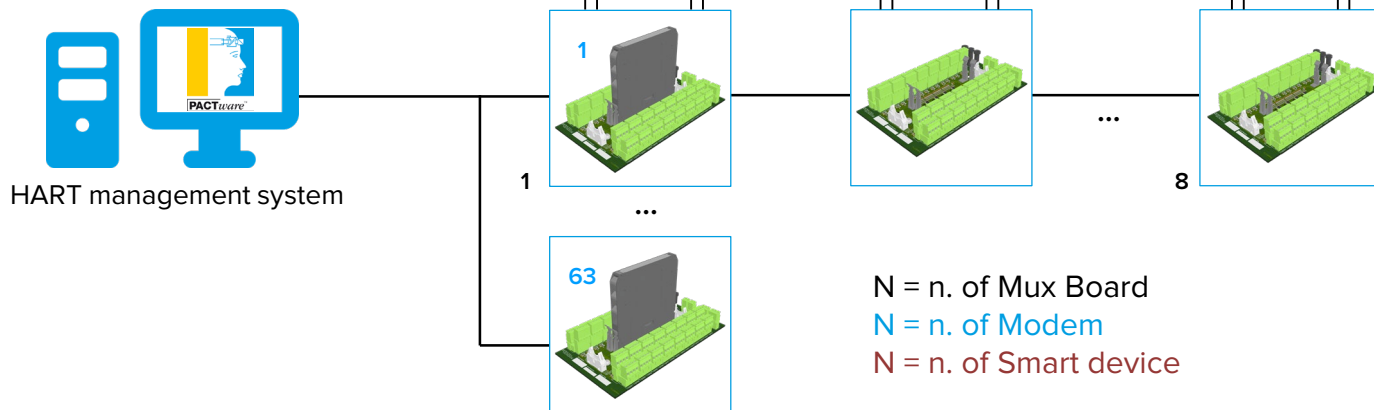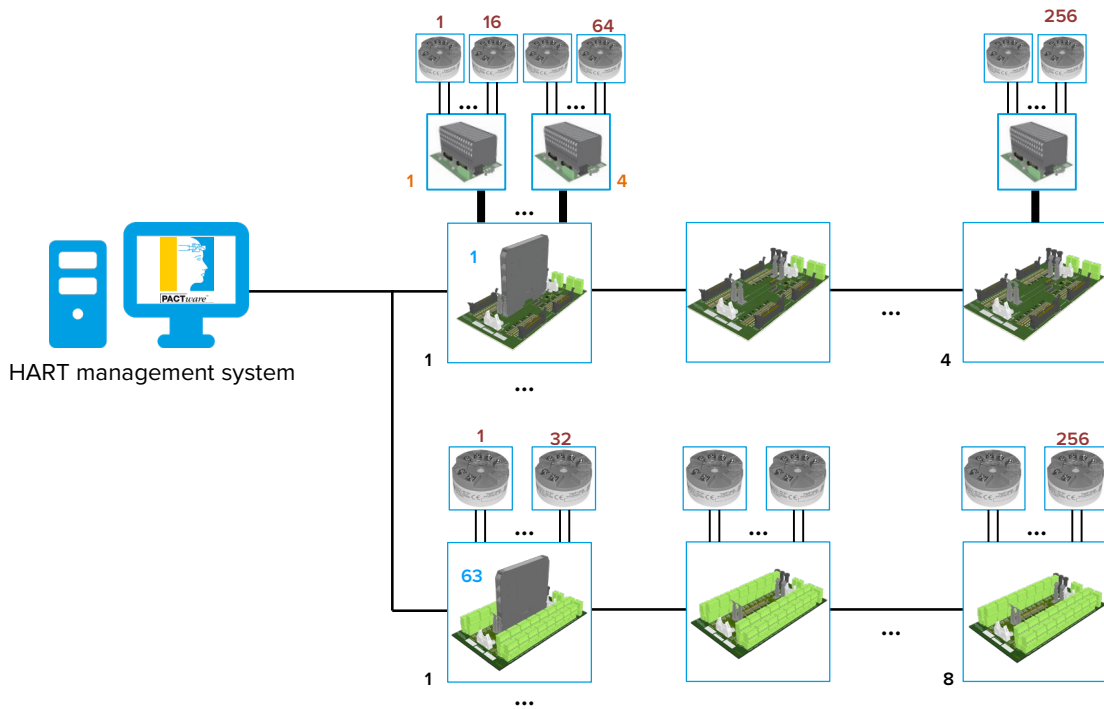# TB-D5001-HRT-004 configuration

- Up to eight TB-D5001-HRT-004 can be interconnected using a single GM5700 MUX
- Hard wire channel connection
- 16.128 maximum number of channels

HART management system

1   32   256

1

1   8

63

N = n. of Mux Board
N = n. of Modem
N = n. of Smart device

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HART Multiplexer configuration
UNIVERSAL APPLICATIONS
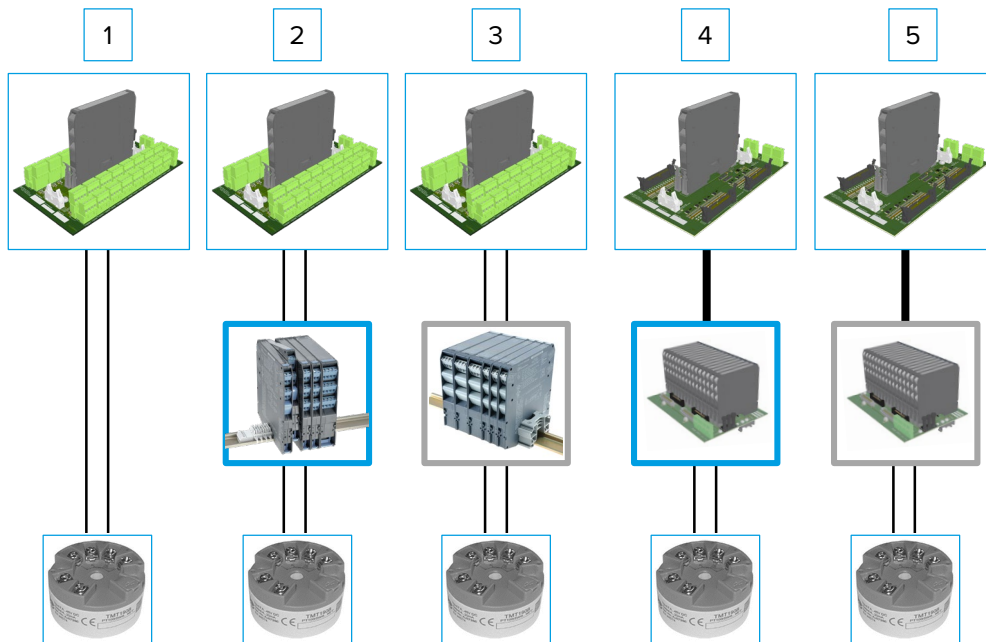
1. TB-D5001-HRT-004 **Non-IS** Signals

2. TB-D5001-HRT-004 **IS** Signals with DIN-Rail mounted Barriers

3. TB-D5001-HRT-004 Non-**IS** Signals with DIN-Rail mounted Isolators

4. TB-D5001-HRT-003 **IS** Signals with Termination Board mounted Barriers

5. TB-D5001-HRT-003 **Non-IS** Signals with Termination Board mounted Isolators

HART Systems - Comparison

Compared to the current state-of-art HART interface solutions on the market, the GMI HART System drastically cuts the number of multiplexer modules required.
Also the baud rate is increased to 115.200 bps from 38.400 bps.
Other HART systems require 496 modules to manage 7.936 ch. instead of GMI's 31.
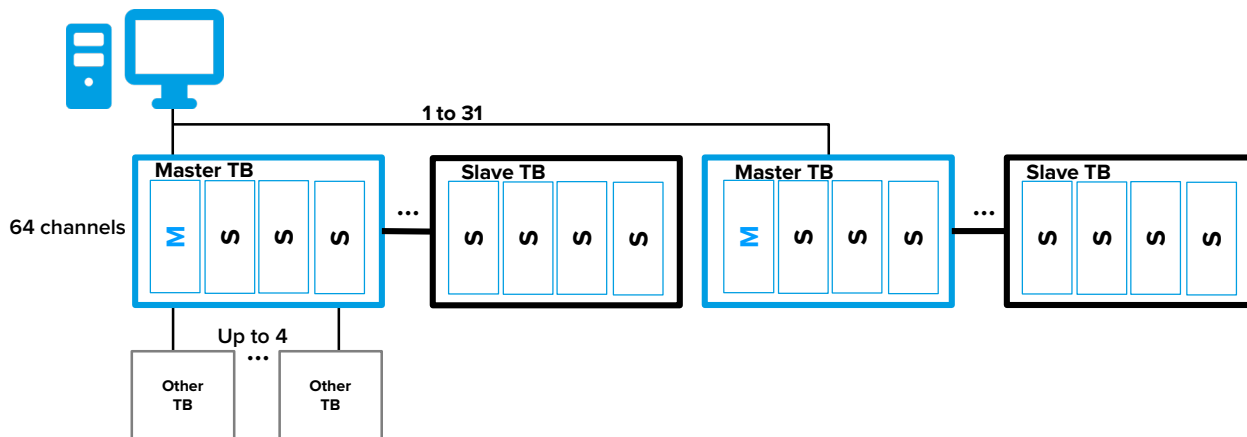
HART Systems - Comparison

HART Multiplexer

# Ch.	GM International	MTL (MTL4851/2)		MTL (MTL4850/4)	P&F (H-System)	P&F (K-System)		
	GM5700	MTL4851	MTL4852	MTL4850/4	HiD2700	KFD2-HMM-16		KFD0-HMS-16
32	1	1	+ 1	1	1	1	+	1
64	1	1	+ 3	2	2	1	+	3
128	1	1	+ 7	4	4	1	+	7
256	1	1	+ 15	8	8	1	+	15
992	4	4	+ 58	31	31	4	+	58
1024	4	4	+ 60	32	-	4	+	60
2016	8	8	+ 118	63	-	8	+	118
2048	8	8	+ 120	-	-	8	+	120
4096	16	16	+ 240	-	-	16	+	240
7936	31	31	+ 465	-	-	31	+	465

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Compatibility with plant management SW

Driver works for «FDT» Containers

Tested:

- Pactware 4.1, 5.0 and above (PACTware Consortium)
- FDT Container (M&M)
- E+H Fieldcare (Endress + Hauser)
- Field Mate (Yokogawa)

To be tested:

- PRM (Yokogawa)
- FDM (Honeywell)
- ValveLink (Emerson)
- ...

FDT Interface ← **GMI 5700 Driver** ✓

Safety, performance and reliability

OUR PRODUCTS, OUR COMMITMENT

GM International designs, engineers and manufactures a complete range of **Intrinsically Safe and SIL Certified Devices**.

For automation packages, DCS - ESD - FGS - BMS - HIPPS - PLC - SCADA - MARINE, in several industrial sectors: Oil and Gas, Petrochemical, Pharmaceutical, Fertilizer, Mining, Food.

- **40 years of Experience**
  founded in 1993,
  former Elcon Instruments
- **100% Internal Production**
  in State-of-the-Art facilities
  near Milan, Italy
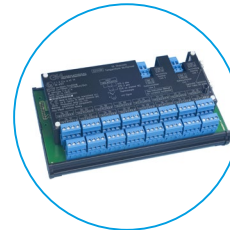- **Global Player**
  with presence in 5 continents

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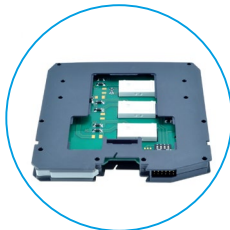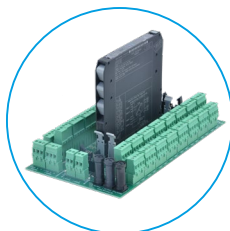
Quality and innovation

OUR GOALS

We guarantee the highest standard of quality

- All products that conform to the most severe specifications worldwide. Products Tested & Certified by over 15 independent Agencies & Laboratories TÜV certified Functional Safety Management, SIL3 Systematic Capabilities (SC).

- Over 15% of our employees dedicated to research and development for innovating products.

- 10% of turnover is re-invested in R&D

- 5 years warranty provided

FUNCTIONAL SAFETY CERTIFICATE
according to IEC EN 61508:2010

Certificate No.: C – IS – 236198 – 09 Rev.1
CERTIFICATE OWNER: G.M. International s.r.l.
                      Via G. Mameli, 53-55
                      I-20852 Villasanta (MB) – ITALY

WE HEREWITH CONFIRM THAT G.M. INTERNATIONAL S.R.L. MEET THE REQUIREMENTS OF IEC EN 61508:2010 PART 1 CLAUSES 5 – 6: The Management of Functional Safety results to be in compliance to the above mentioned Clauses of IEC 61508: 2010, for safety related systems up to and included SIL 3.

Examination result: G.M. International s.r.l. was found to meet the standard defined requirements according to IEC EN 61508:2010 part 1 clause 5 - 6, under fulfilment of the conditions listed in the related Reports, in their currently valid version, on which this Certificate is based

Examination parameters: Documentation and Management of the Functional Safety

Applicable lifecycle phases: Phase 10 – Realisation of safety-related system (IEC EN 61508-1 Clause 7)

Official Report No.:   R-IS-236198-05 Rev.1

Reference Standard   IEC EN 61508:2010 Part 1

Sesto San Giovanni, June, 08th 2016

TÜV ITALIA Srl

TÜV ITALIA Srl
Industry Service Division
Director
Paolo Marcone

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Reference List

System vendors

- ABB
- EMERSON
- GEBHARDT AUTOMATION
- HIMA
- HONEYWELL
- ICS TRIPLEX
- INVENSYS
- SIEMENS
- SCHNEIDER
- ROCKWELL AUTOMATION
- YOKOGAWA

E.P.C.

- AMEC FOSTER WHEELER
- BECTEL
- FLUOR
- HHI
- JACOBS
- L&T
- MCDERMOTT
- NPCC
- SAIPEM
- PARSONS
- PETROFAC
- SK ENGINEERING
- SNC-LAVALIN
- TECNIMONT
- TECHNIP-FMC
- TR
- WORLEY

O.E.M.

- ABB OY DRIVES
- ACCAGEN SA
- APPLIED WEIGHING INT.
- BOBST GROUP
- CAMERON
- CANRIG DRILLING TECH.
- CLAMPON
- DRESSER RAND
- FMC
- GE
- HALLIBURTON
- HANLA LEVEL
- INKMAKER
- KONGSBERG SEATEX
- NOV
- PRECIAMOLEN
- SCHLUMBERGER
- SIEMENS IND. TURBINES
- SKANA KOREA HYDRA.
- WARTSILA NORWAY
- WEATHERFORD

End users

- 3M
- ADMA-OPCO
- AGIP
- ARAMCO
- BASF
- BHP
- BP
- CIBA GEIGY
- CAMERON
- ENEL
- ENI
- EXXON-MOBIL
- GASCO
- KOC / KNPC
- LOTOS
- ONGC
- ORLEN
- PFIZER
- SASOL
- SHELL
- SIRTE OIL
- STATOIL
- TOTAL

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