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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 20830-2015

Replacing GB/Z 20830-2007

**PROFL safe -- Profile for safety technology on PROFIBUS DP
and PROFINET IO**

基于PROFIBUS DP和PROFINET IO的功能安全通信行规-PROFIsafe
(English Translation)

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Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules.

This standard replaces GB/Z20830-2007 "based on functional safety communication profiles PROFIBUSDP and PROFINETIO of ---PROFIsafe ". Compared with

GB/Z20830-2007, in addition to editorial changes outside the main technical changes are as follows.

--- Increased "IEC 61784-3 relationship with other standards (machinery) of" and "IEC 61784-3 and other standards (process) in the introduction the relationship "icon (see introduction in Figures 1 and 2);

--- Added PROFIsafe overview of the contents (see 4);

--- The 2007 consolidated version of Chapters 5 and 6 to Chapter 5 (see 5, 2007, edition of 5 and 6);

Content --- Chapter 6 Replace the contents of the 2007 version of Chapter 7 (see 6 and 7 of the 2007 edition);

Content --- Replace the contents of Chapter 7 of the 2007 version of Chapter 8 (see 7, 2007 edition of 8);

Content --- Chapter 8 Replace the contents of the 2007 version of Chapter 9 (see 8, 2007 edition of 9);

--- Delete the contents of the 2007 version of Chapter 10;

--- The combined 2007 Edition Chapter 11 and Chapter 12 to Chapter 9 (see 9, 2007 edition of 11 and 12);

--- Added for "assessment" describe (see 10);

--- Added "CPF3 functional safety communication profiles for additional information" and "CPF3 functional safety profiles of assessment information." Description (see Appendix A and Appendix B).

This standard uses the translation method identical with IEC 61784-3-3:2010 "Industrial communication networks profiles - Part 3-3. Functional safety now Field bus for additional specifications CPF3 of. " Correspondence between the consistency of the standards of international documents and normative references of our document Appendix NA.

The standard proposed by China Machinery Industry Federation.

Control and automation Standardization Technical Committee (SAC/TC124) is under the jurisdiction of this standard is measured by the country's industrial processes.

This standard was drafted. Machinery Industrial Instrumentation Technology and Economy Institute, Beijing Machinery Industry Automation Research Institute, Southwest University, CAS Shenyang Institute of Automation, Shanghai Automation Instrumentation Co., Tianhua Institute of Chemical Machinery and Automation, Chinese stone Group Shanghai Engineering Co., Ltd., Siemens (China) Co., Ltd.

Introduction

IEC 61158 fieldbus standard and its companion standard IEC 61784-1 and IEC 61784-2 defines a common set of communication protocols to Implementation of distributed control automation applications. Fieldbus technology has now been widely accepted and proven feasible. Thus, many fieldbus tech-Surgery rising, covering the areas not yet standardized, such as real-time, safety-related functions and information security related applications.

This standard is based on IEC 61508 series of standards describes the functional safety communications relevant principles, norms based on IEC 61784-1, IEC 61784-2 and IEC 61158 series of standards and protocol layer communication profiles several secure communications layer (profiles and the corresponding protocol), but does not include Including electrical safety and intrinsic safety aspects.

Figure 1 shows the relationship between this standard and safety-related and mechanical environment between the fieldbus standard.

NOTE: GB 28526 in 6.7.6.4 (high complexity) and 6.7.8.1.6 (low complexity) defines the relationship between the PL (category) and the SIL.

1 IEC 61784-3 Diagram with other standards (machinery) of

Figure 2 shows the relationship between this standard and process-related safety and environment between the fieldbus standard.

a for the electromagnetic environment specified otherwise, see IEC 61326-3-1.

2 IEC 61784-3 Diagram with other standards (procedures)

According to IEC 61508 series of standards to achieve a secure communication layer as a safety-related components of the system for safety-related systems on the fieldbus between two or more participants to transmit a message (information) to provide the necessary credibility, or something fieldbus error or failure Member of safe behavior provides sufficient credibility.

This standard specifies the safety communication layer, so that the fieldbus can be used to achieve functional safety requirements for Safety Integrity Level (SIL) applications, the SIL rating by their respective functional safety communication profiles to specify.

A system depends on the final declaration of SIL within the system of the selected functional safety communication profiles to achieve the standard equipment ---to achieve functional safety communication profiles is not sufficient to prove that the device is a security device.

This standard describes.

The basic principles of safety-related data communication needs --- to achieve IEC 61508

series of standards, including the possible transmission failure, remedial measures Shi and consider the impact on the integrity of the data;

--- For functional safety IEC 61784-1 and IEC 61784-2 compliance in a plurality of communication lines ethnic profiles are described;

--- Security layer IEC 61158 series of standards in communication services and protocols partially extended.

Based PROFIBUSDP and PROFINETIO Functional safety communication profile --- PROFIsafe

1 Scope

This standard specifies based on IEC 61784-1, IEC 61784-2 (CP3/1, CP3/2, CP3/4, CP3/5 and CP3/6) and IEC 61158 Type 3 and Type 10 CPF3 secure communication layer (services and protocol), and identifies the definitions in IEC 61784-3 Functional safety communication principle and this standard secure communication layer are related.

Note: Does not include electrical safety and intrinsic safety aspects. Electrical safety and danger (eg shock) related. Intrinsically safe and related to potentially explosive atmospheres Risks associated.

This standard defines the mechanism between the use of fieldbus technology in a distributed network participants transport safety-related messages, the machine System in line with IEC 61508 series of standards for the functional safety requirements. These mechanisms can be used in various industrial applications such as process control, manufacturing self Automation and machinery.

The standard for developers and evaluators conforming to this standard equipment and systems to provide guidance.

NOTE: A system depends on the final declaration of SIL functional safety communication profiles within the system to achieve the selected --- in the standard equipment in accordance with this standard solid Now functional safety communication profiles is insufficient to prove that the device has a qualified safety equipment.

2 Normative references the following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

ISO 13849-1 Safety of machinery - Safety-related control system components - Part 1. General principles for design (Safetyofmachinery-Safety-relatedpartsofcontrolsystems-Part 1. Generalprinciplesfordesign) IEC 61000-6-2 Electromagnetic compatibility - Part 6-2. Generic standards Immunity for industrial environments (Electromagneticcom-patibility (EMC) -Part 6-2. Genericstandards-Immunityforindustrialenvironments) IEC 61010-1 measurement, control and laboratory safety requirements for electrical equipment - Part 1.