

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Programmable controllers –
Part 9: Single-drop digital communication interface for small sensors and
actuators (SDCI)**

**Automates programmables –
Partie 9: Interface de communication numérique point à point pour petits
capteurs et actionneurs (SDCI)**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROGRAMMABLE CONTROLLERS –

Part 9: Single-drop digital communication interface for small sensors and actuators (SDCI)

FOREWORD

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International Standard IEC 61131-9 has been prepared by subcommittee 65B: Measurement and control devices, in collaboration with subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this standard is based on the following documents:

FDIS	Report on voting
65B/874/FDIS	65B/889/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 61131 series, published under the general title *Programmable controllers*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

Withdrawn

INTRODUCTION

0.1 General

IEC 61131-9 is part of a series of standards on programmable controllers and the associated peripherals and should be read in conjunction with the other parts of the series.

Where a conflict exists between this and other IEC standards (except basic safety standards), the provisions of this standard should be considered to govern in the area of programmable controllers and their associated peripherals.

The increased use of micro-controllers embedded in low-cost sensors and actuators has provided opportunities for adding diagnosis and configuration data to support increasing application requirements.

The driving force for the SDCI (IO-Link™¹) technology is the need of these low-cost sensors and actuators to exchange this diagnosis and configuration data with a controller (PC or PLC) using a low-cost, digital communication technology while maintaining backward compatibility with the current DI/DO signals.

In fieldbus concepts, the SDCI technology defines a generic interface for connecting sensors and actuators to a Master unit, which may be combined with gateway capabilities to become a fieldbus remote I/O node.

Any SDCI compliant Device can be attached to any available interface port of the Master. SDCI compliant Devices perform physical to digital conversion in the Device, and then communicate the result directly in a standard format using "coded switching" of the 24 V I/O signalling line, thus removing the need for different DI, DO, AI, AO modules and a variety of cables.

Physical topology is point-to-point from each Device to the Master using 3 wires over distances up to 20 m. The SDCI physical interface is backward compatible with the usual 24 V I/O signalling specified in IEC 61131-2. Transmission rates of 4,8 kbit/s, 38,4 kbit/s and 230,4 kbit/s are supported.

The Master of the SDCI interface detects, identifies and manages Devices plugged into its ports.

Tools allow the association of Devices with their corresponding electronic I/O Device Descriptions (IODD) and their subsequent configuration to match the application requirements.

The SDCI technology specifies three different levels of diagnostic capabilities: for immediate response by automated needs during the production phase, for medium term response by operator intervention, or for longer term commissioning and maintenance via extended diagnosis information.

The structure of this standard is described in 4.8.

Conformity with IEC 61131-9 cannot be claimed unless the requirements of Annex G are met.

Terms of general use are defined in IEC 61131-1 or in the IEC 60050 series. More specific terms are defined in each part.

¹ IO-Link™ is a trade name of the "IO-Link Consortium". This information is given for the convenience of users of this international Standard and does not constitute an endorsement by IEC of the trade name holder or any of its products. Compliance to this standard does not require use of the registered logos for IO-Link™. Use of the registered logos for IO-Link™ requires permission of the "IO-Link Consortium".

0.2 Patent declaration

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning the point-to-point serial communication interface for small sensors and actuators as follows, where the [xx] notation indicates the holder of the patent right:

DE 10030845B4 EP 1168271B1 US 6889282B2	[AB]	Fieldbus connecting system for actuators or sensors
EP 1203933 B1	[FE]	Sensor device for measuring at least one variable
DE 10 2004 035 831.1	[SI]	Operational status of a computer system is checked by comparison of actual parameters with reference values and modification to software if needed
DE 102 119 39 A1 US 2003/0200323 A1	[SK]	Coupling apparatus for the coupling of devices to a bus system

IEC takes no position concerning the evidence, validity and scope of these patent rights.

The holders of these patents rights have assured the IEC that they are willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with IEC.

Information may be obtained from:

[AB]	ABB AG Heidelberg Germany
[FE]	Festo AG Esslingen Germany
[SI]	Siemens AG Otto-Hahn-Ring 6 81739 Munich Germany
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