e!COCKPIT
Fundamentals

WE INNOVATE!

1

General for controlling the WAGO-I/O-SYSTEM

- History
- IEC 61131
- Programming system
- Application

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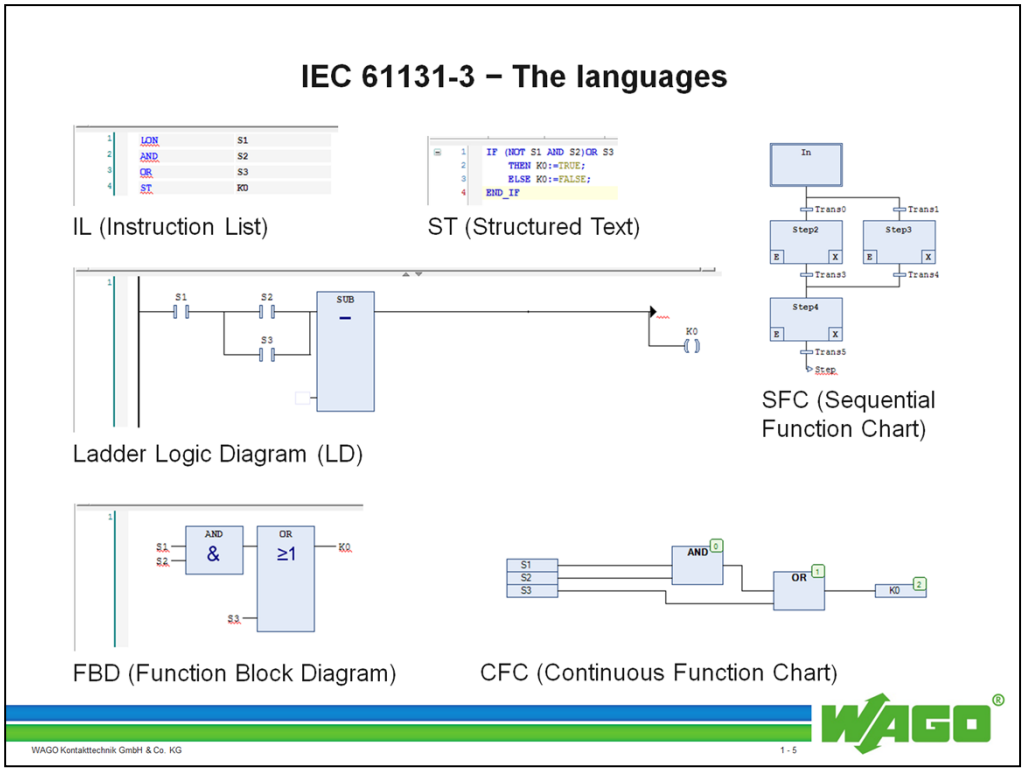
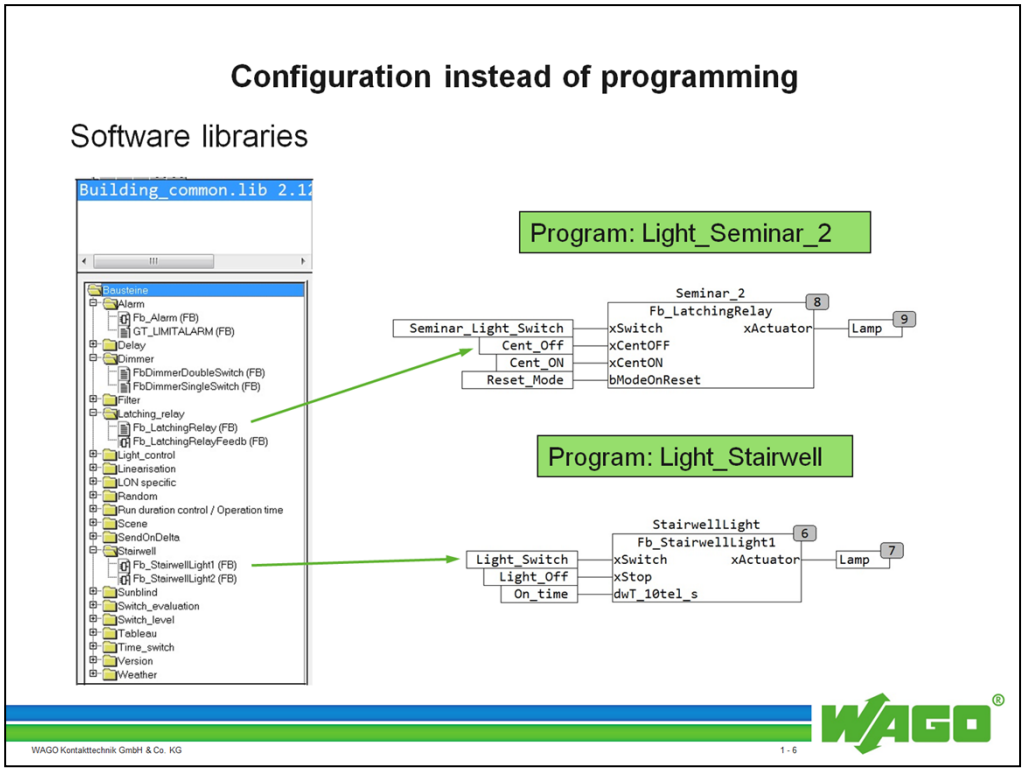
History

Programmable Logic Controllers

• 1965 ... 70	In the US, the automotive industry encouraged the development of a new type of control for converting transfer lines (PLC-Programmable Logic Controllers)
• Beginning in 1974	These controllers have been used in Germany as well (PLC - Programmable Logic Controller)
• 1983	DIN 19239
• 1993	DIN IEC 61131-3
• Today	Large selection of manufacturers. IEC 61131 contains definitions of requirements for modern PLC systems in order to counteract language elements and provide a uniform program structure independent of programming systems.



English		German		
abbr.	Designation	abbr.	Designation	Remarks
IL	Instruction List	**AWL**	Instruction list	Comparable to the assembler
LD	Ladder Diagram	**KOP**	Ladder diagram	Comparable to a circuit diagram (in exploded view) that has been rotated 90°.
FBD	Function Block Diagram	**FBS (FUP)**	Function Block-Language	In part (in particular for Siemens STEP 7) also known as LD (Logic Diagram).
SFC	Sequential Function Chart	**AS**	Sequential function chart	a type of status diagram in STEP 7 known as S7 GRAPH. The IEC 61131-3: 2003 sees the SFC as an evolution of Grafcet according to EN 60848.
ST	Structured Text	**ST**	Structured text	Derivation of the high level language PASCAL, designated as SCL (Structured Control Language) for STEP 7.
CFC	Continuous Function Chart (Only mentioned in IEC 61131-3)	**CFC**	Continuous function chart	In CFC, the function blocks (which are identical with those in FBD) are freely positioned.



There are a number of libraries in different areas, the various components which are already finished.

Controllers

e!*COCKPIT* currently supports the following controllers

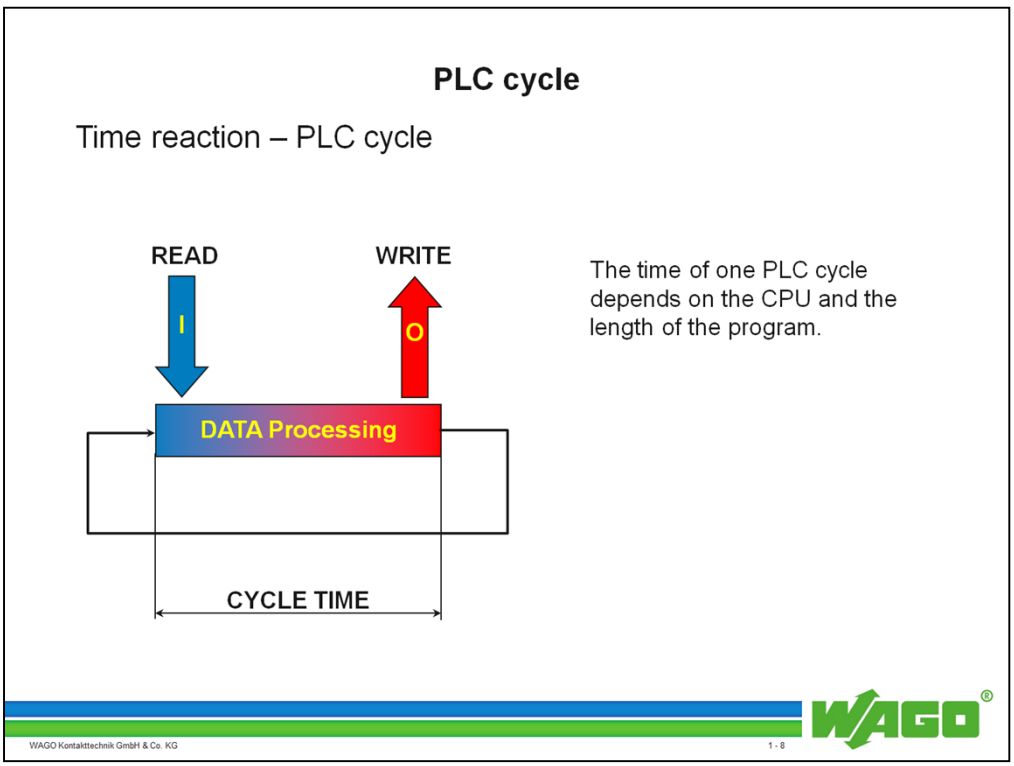
PFC200 750-8202

PFC200 750-8203

PFC200 750-8204

PFC200 750-8206

Programming according to IEC 61131-3



Like most PLCs, a WAGO controller also functions using the IPO principle. It has an input part, a processing part, and an output part.

The data from connected sensors and actuators are connected to the controller using Input/output devices.

The controller functions cyclically: It reads the values of all the inputs at the beginning of a cycle (“read process image” is also used in conjunction with this).

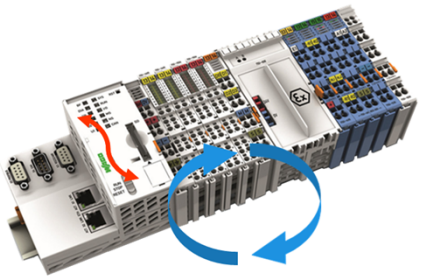
Afterwards, all program instructions are (sequentially) processed and the assigned outputs are written at the end of the cycle into the output components.

To optimize processing, reading and writing the process data is carried out in one step at the beginning of the cycle.

Application

Stand alone vs. networked controllers

- PLC can control autonomous units
- Thanks to the networking features many PLC can be connected to create larger systems



As a system partner, WAGO solves all automation tasks using centralized and decentralized control architecture in all sectors of industrial, process, and building automation.

The IEC 61131 programming standard is thus an important guideline for modular automation components.

Integrated Web pages and Web-based visualization provide IT applications with real-time process data.

Both large memory and an integrated multitasking system readily meet stringent automation requirements.

A large number of library functions support both software/hardware interfaces and integrated file system.

Application

Decentralized intelligence with networked controllers