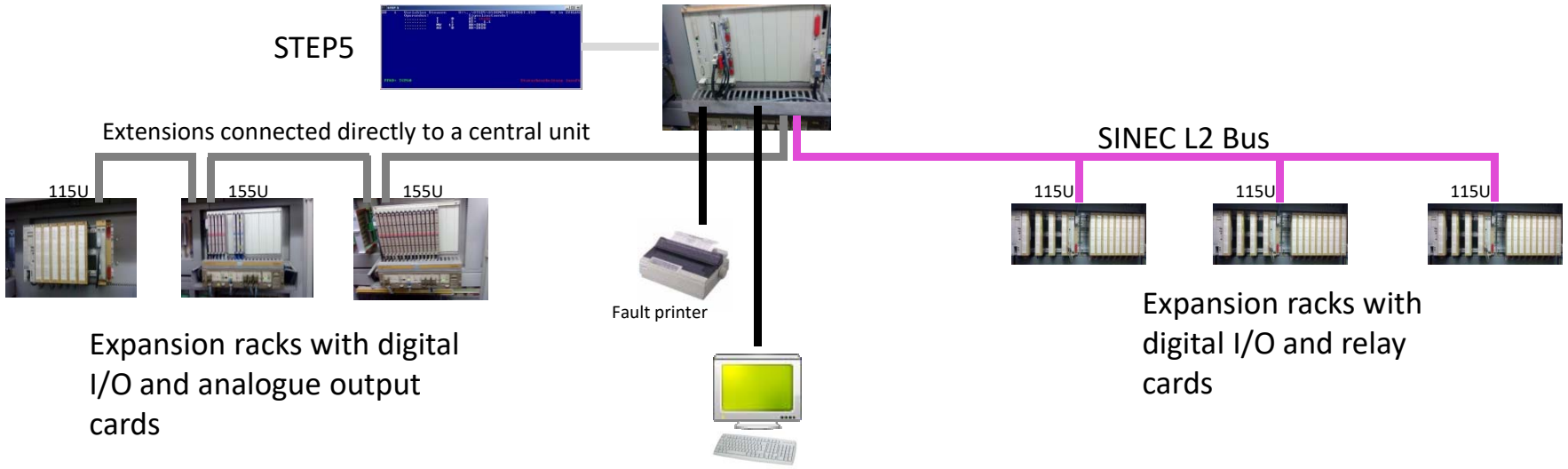
Plant modernisation with ABC IT Systems Version 2

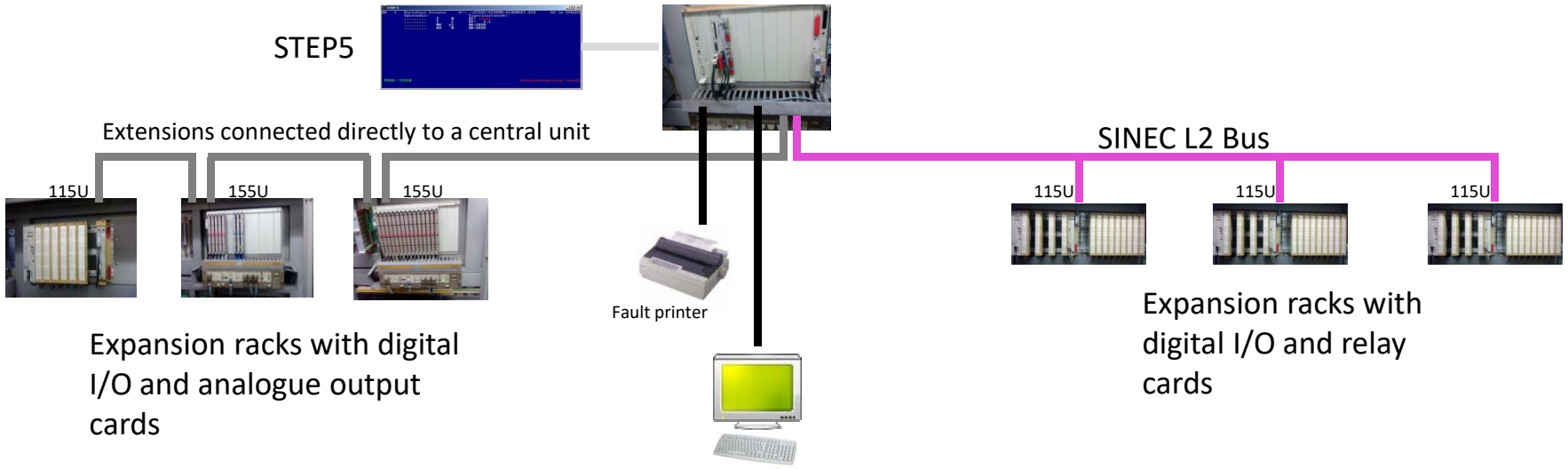
Current Condition

- Simatic S5 PLC System 155U
  - CPU 948B
  - CP 581 – 0EB12 (basic component group)
  - CP 581 – 2LA11 (mass storage)
  - MONA C (screen, keyboard)
  - AS 304 (direct expansions)
  - IM 308 (L2 bus)
  - STEP 5 programming



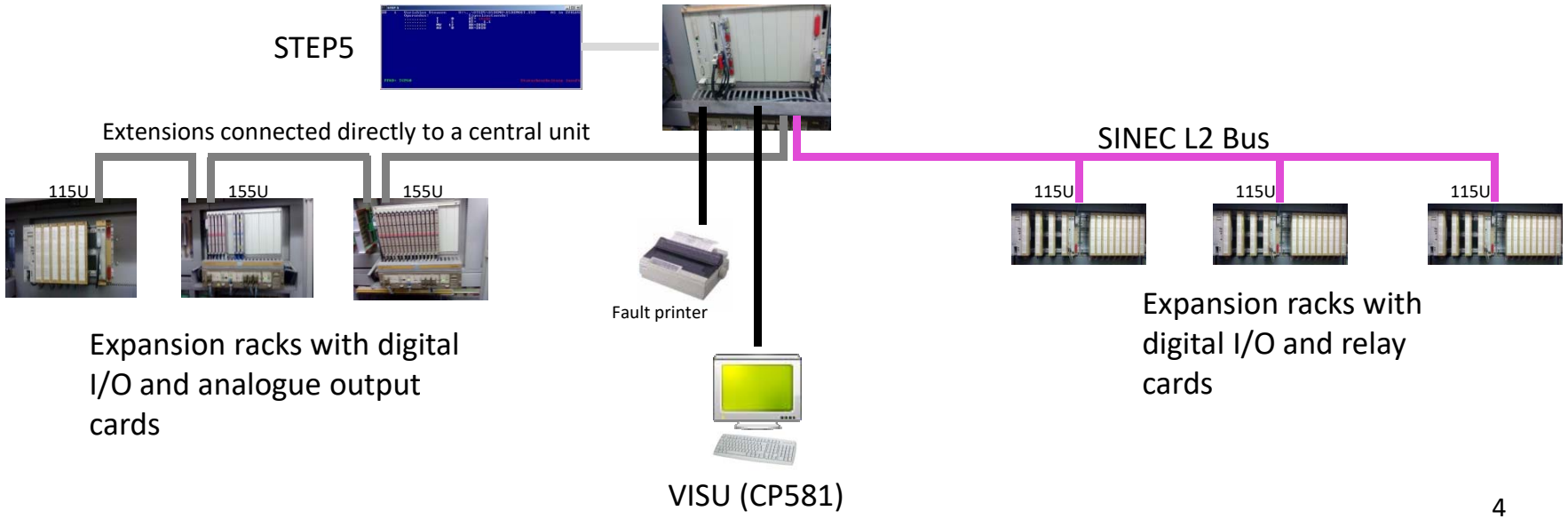
Current Condition - Assessment

- VISU
  - CP581 possess limited lifespans (component discontinued)
  - Customisation of the VISU (CP581) very complicated
- Relay cards
  - Spare parts procurement difficult, repairs expensive
- Siemens CPU948 with 1.6MB (large version) program and data
  - Porting the existing STEP5 program code to STEP7 is very complex.
  - The program structure does not permit simple porting and taking (back) into operation on the basis of the S7-400, for example.



Modernisation targets

- Replacement of CPU948 with X-CPU (STEP5 and STEP7 programmable).
- Connection of the new VISU WinCC.
- Deactivation of the old VISU (CP581) and malfunction alert printer.
- Replacement of expansion racks with modern field-bus components (e.g. Profibus, Profinet, Ethercat).
  - Replacement of digital I/O, relay and analogue cards with, for example, Siemens ET200 modules.
- Deactivation of the SINEC L2 bus and direct expansion bus.
- Modernisation of the system to make it future-proof.

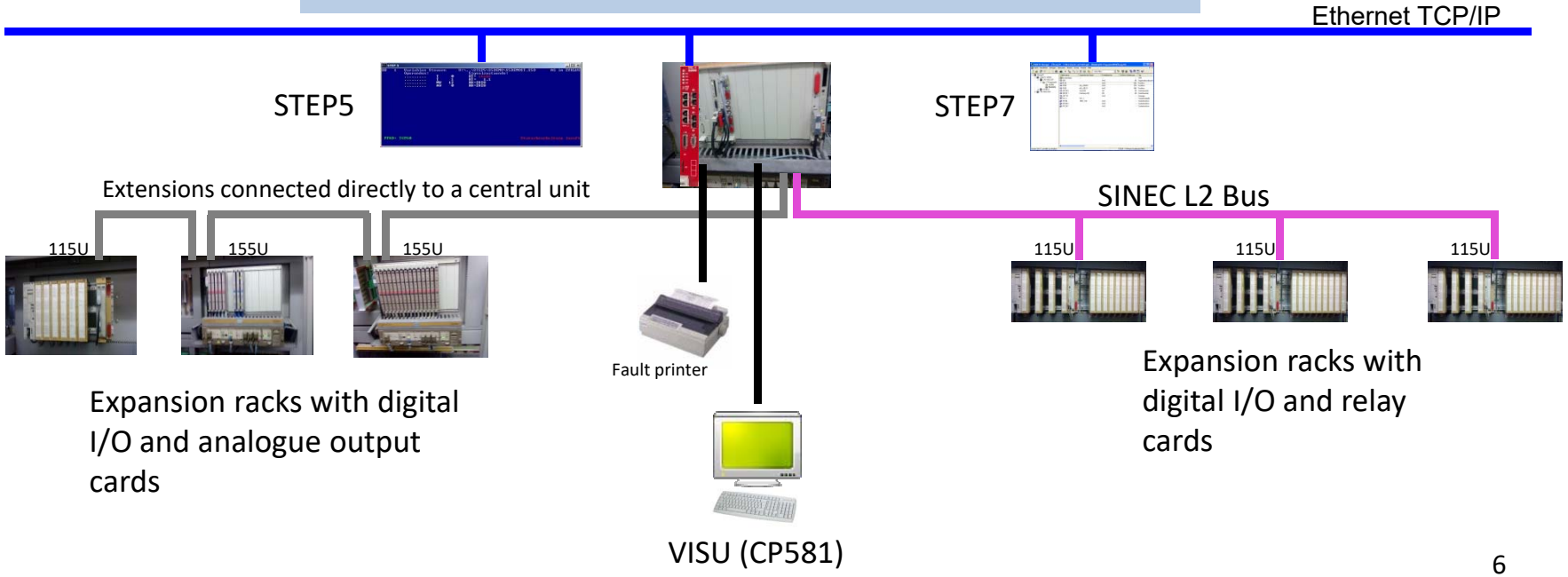


ABC retrofit - concept

- ✓ The ABC retrofit concept constitutes the basis for the expansion and modernisation of Simatic S5 system controls.
- ✓ The costs for the individual modernisation and conversion phases may be precisely specified (cost control).
- ✓ Systems will be modernised according to the state-of-the-art over a planned period of time (planning reliability).
- ✓ No additional system downtimes during the individual phases of modernisation.

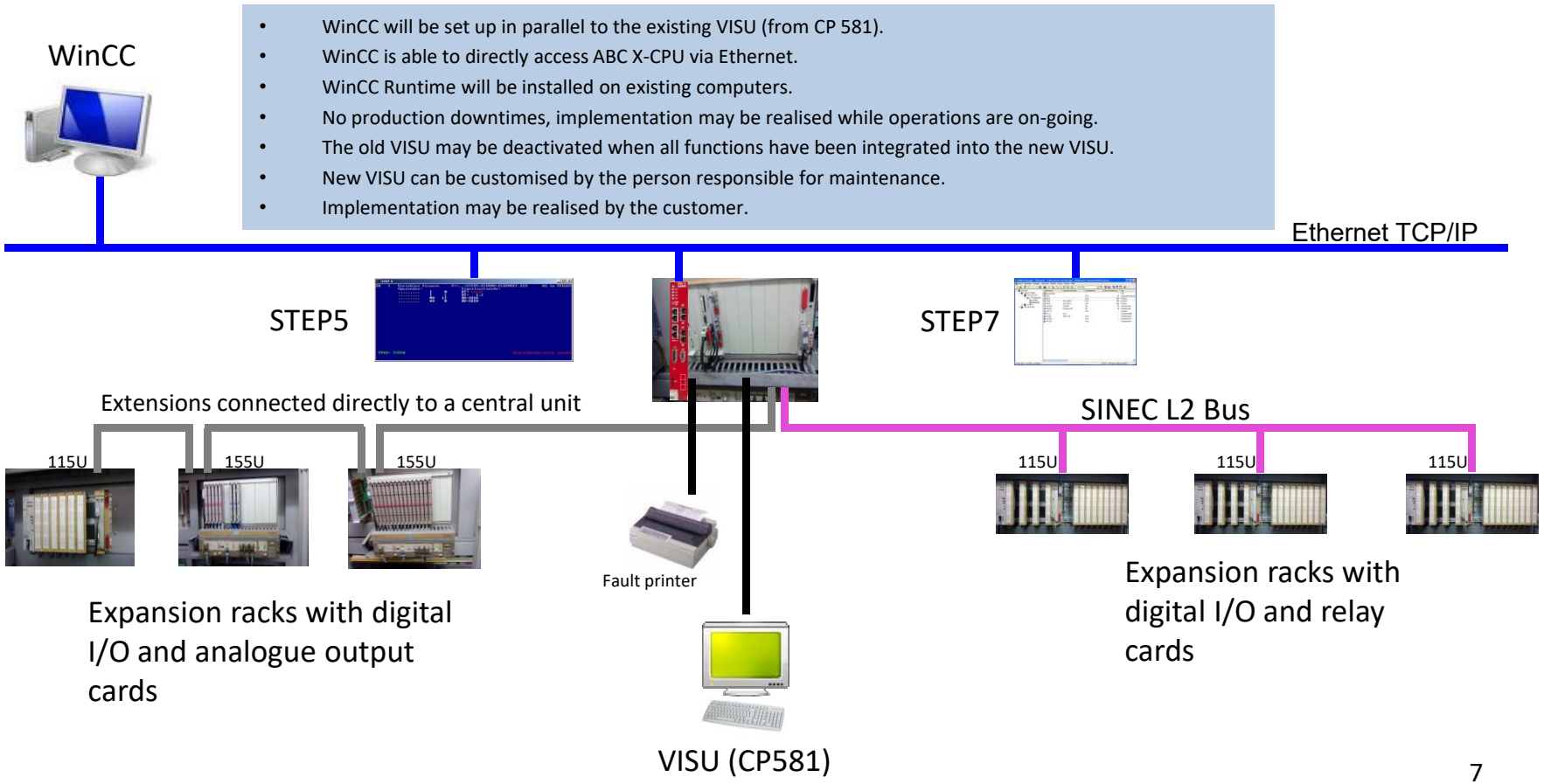
1. Replacement of CPU944B with X-CPU

- Free review of the S5 software.
- Software customisations for mixed operations (optional).
- Program pulled from existing CPU948.
- The power to the existing control will be switched off, the CPU944B will be replaced with ABC X-CPU.
- Ethernet connection to ABC X-CPU.
- Loading of the S5/S7 program with STEP5/7.
- Test run / production with ABC X-CPU.
- Only the CPU948 component group needs to be refitted if taking into operation is interrupted; the system will then be ready for production.



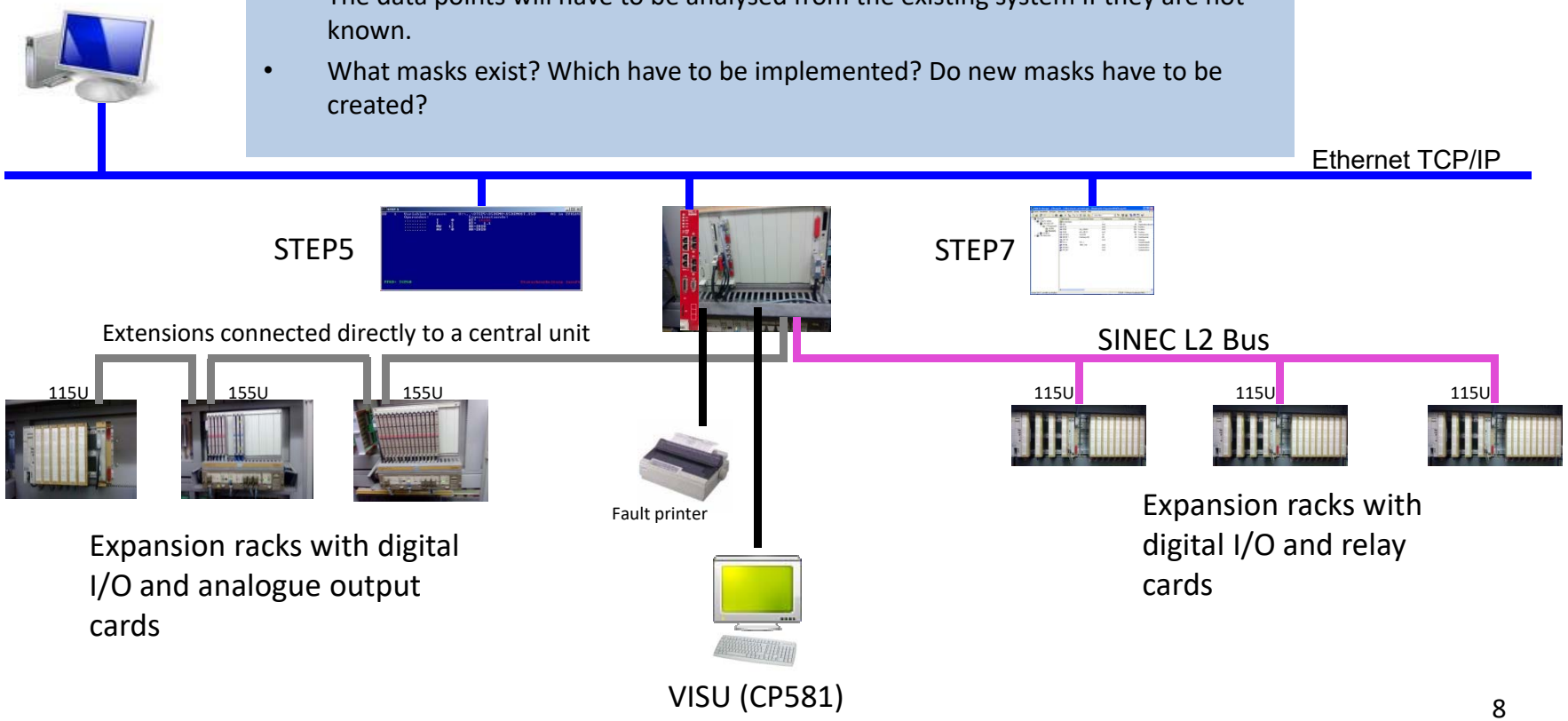
2. Connection of the new VISU

- WinCC will be set up in parallel to the existing VISU (from CP 581).
- WinCC is able to directly access ABC X-CPU via Ethernet.
- WinCC Runtime will be installed on existing computers.
- No production downtimes, implementation may be realised while operations are on-going.
- The old VISU may be deactivated when all functions have been integrated into the new VISU.
- New VISU can be customised by the person responsible for maintenance.
- Implementation may be realised by the customer.



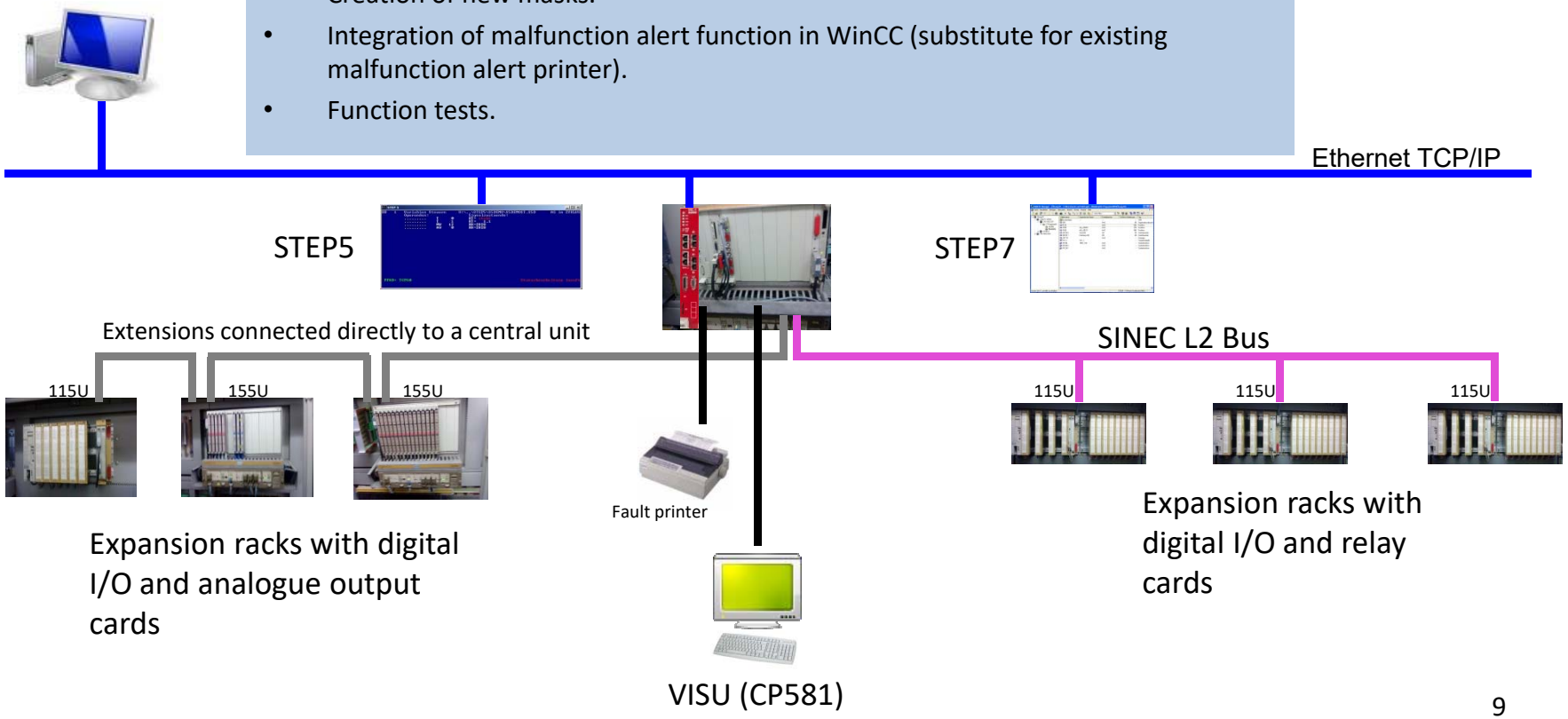
2.1 Evaluation of the existing VISU

- The data points of the existing VISU are required to create a new VISU.
- The data points will have to be analysed from the existing system if they are not known.
- What masks exist? Which have to be implemented? Do new masks have to be created?



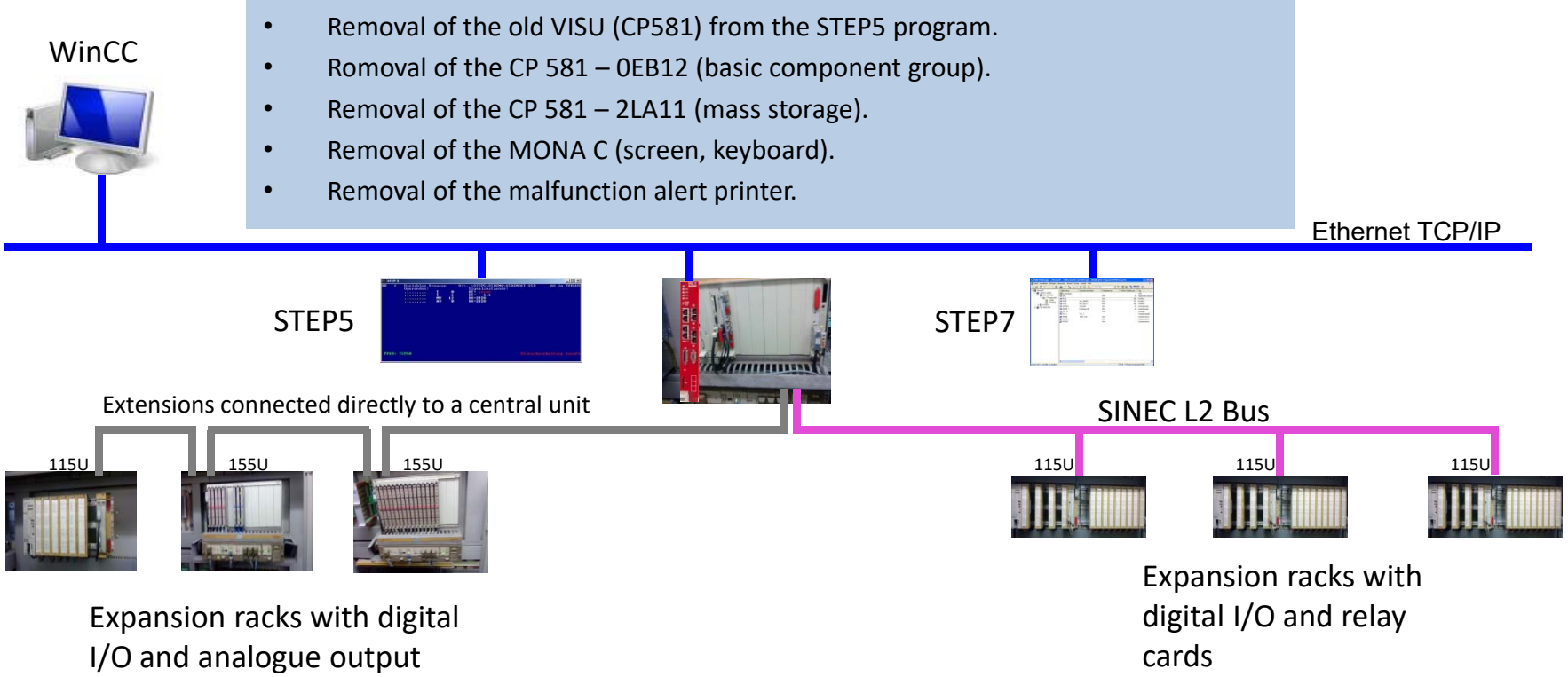
2.2 Create of a new VISU

- Integration of data points into the new WinCC flexible VISU.
- Creation of new masks.
- Integration of malfunction alert function in WinCC (substitute for existing malfunction alert printer).
- Function tests.



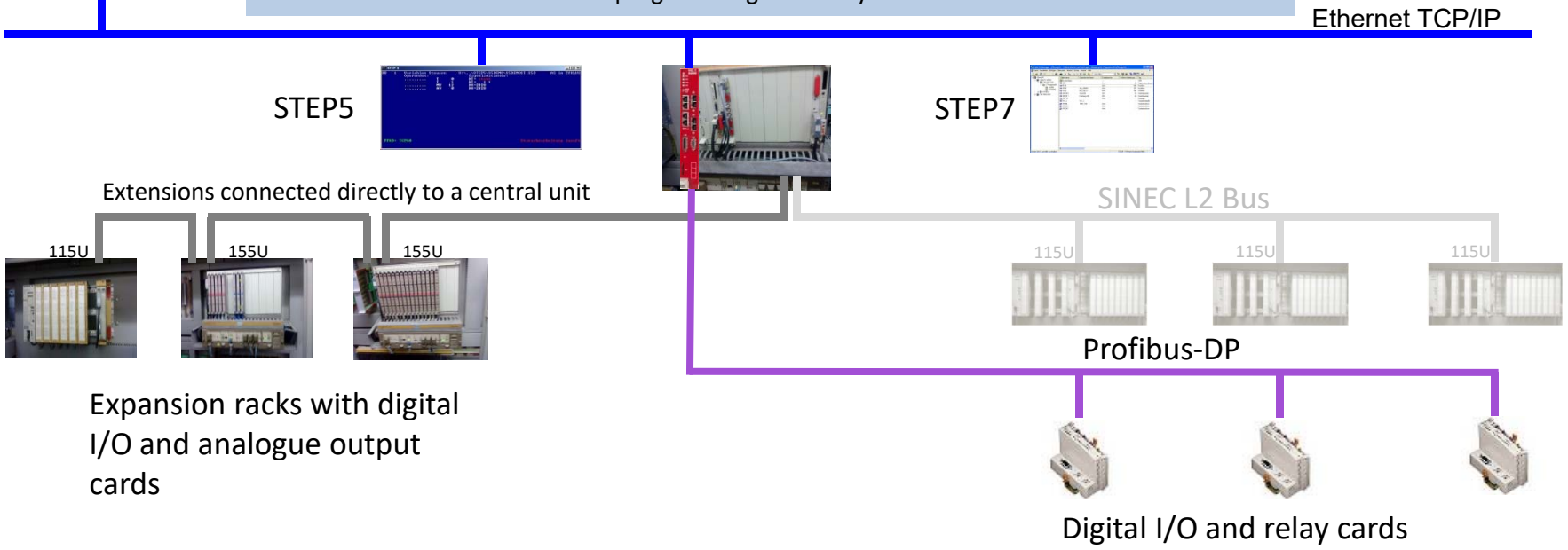
2.3 Removal of the old VISU

- Removal of the old VISU (CP581) from the STEP5 program.
- Romoval of the CP 581 – 0EB12 (basic component group).
- Removal of the CP 581 – 2LA11 (mass storage).
- Removal of the MONA C (screen, keyboard).
- Removal of the malfunction alert printer.



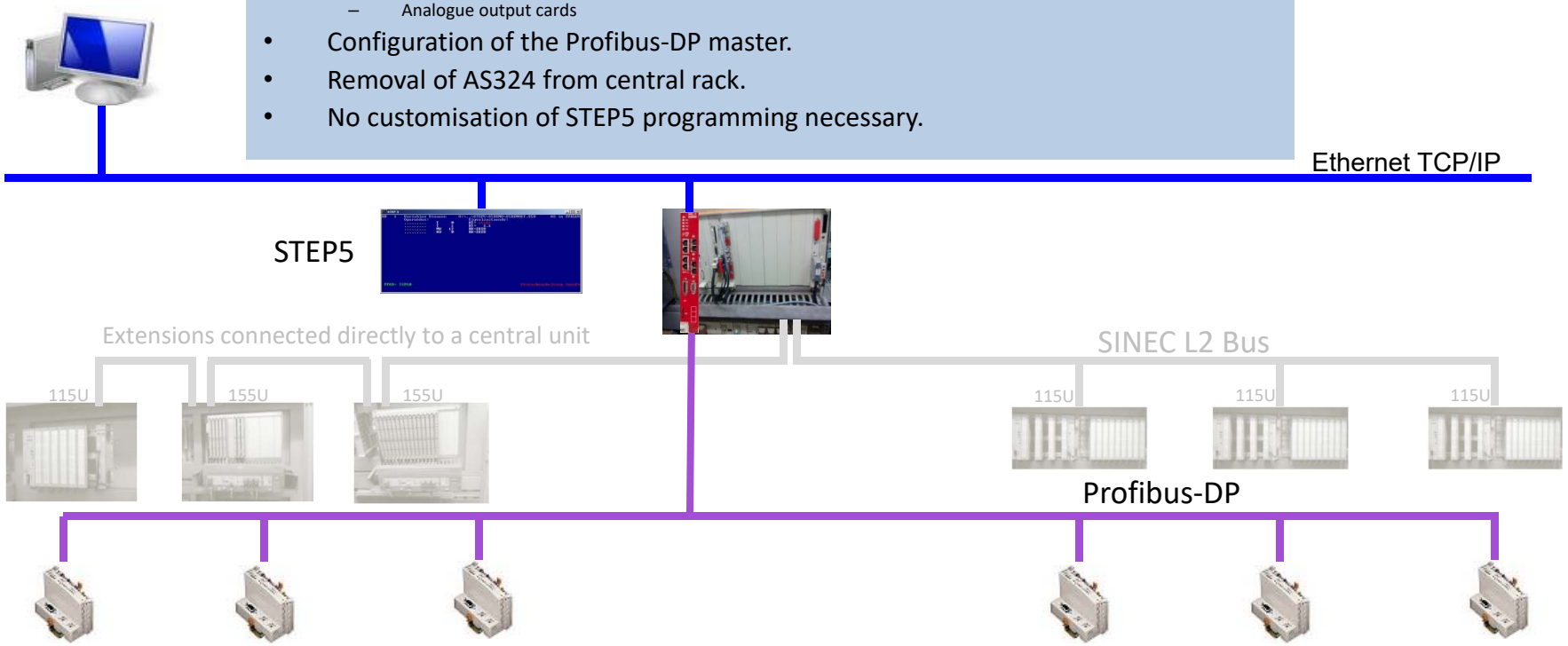
3.1 Replacement of the expansion rack via SINEC L2 bus with Profibus (Profinet) components

- Plugging of the ABC Profibus-DP extension board on to ABC X-CPU.
- Replacement of expansion racks with Profibus-DP components, e.g. ET200.
  - Digital I/Os
  - Relay output cards
- Configuration of the Profibus-DP master.
- Removal of IM308 from central rack.
- No customisation of STEP5 programming necessary.



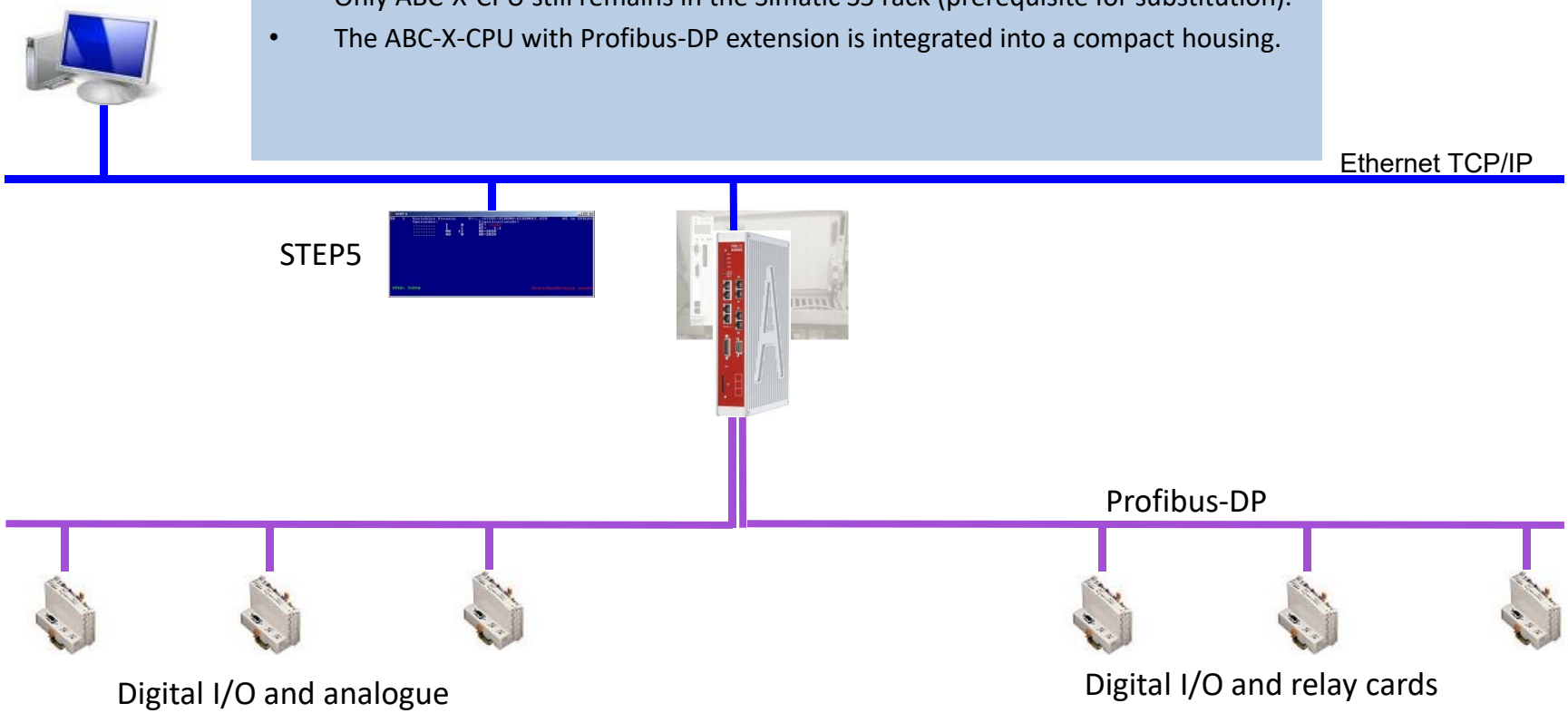
3.2 Replacement of directly connected expansion rack with Profibus (Profinet) components

- Replacement of expansion racks with Profibus-DP components e.g. ET200.
  - Digital I/Os
  - Analogue output cards
- Configuration of the Profibus-DP master.
- Removal of AS324 from central rack.
- No customisation of STEP5 programming necessary.



3.3 Removal of the central rack

- All Simatic S5 rack components are realised decentrally via Profibus-DP.
- Only ABC-X-CPU still remains in the Simatic S5 rack (prerequisite for substitution).
- The ABC-X-CPU with Profibus-DP extension is integrated into a compact housing.



Retrofit with ABC X-CPU

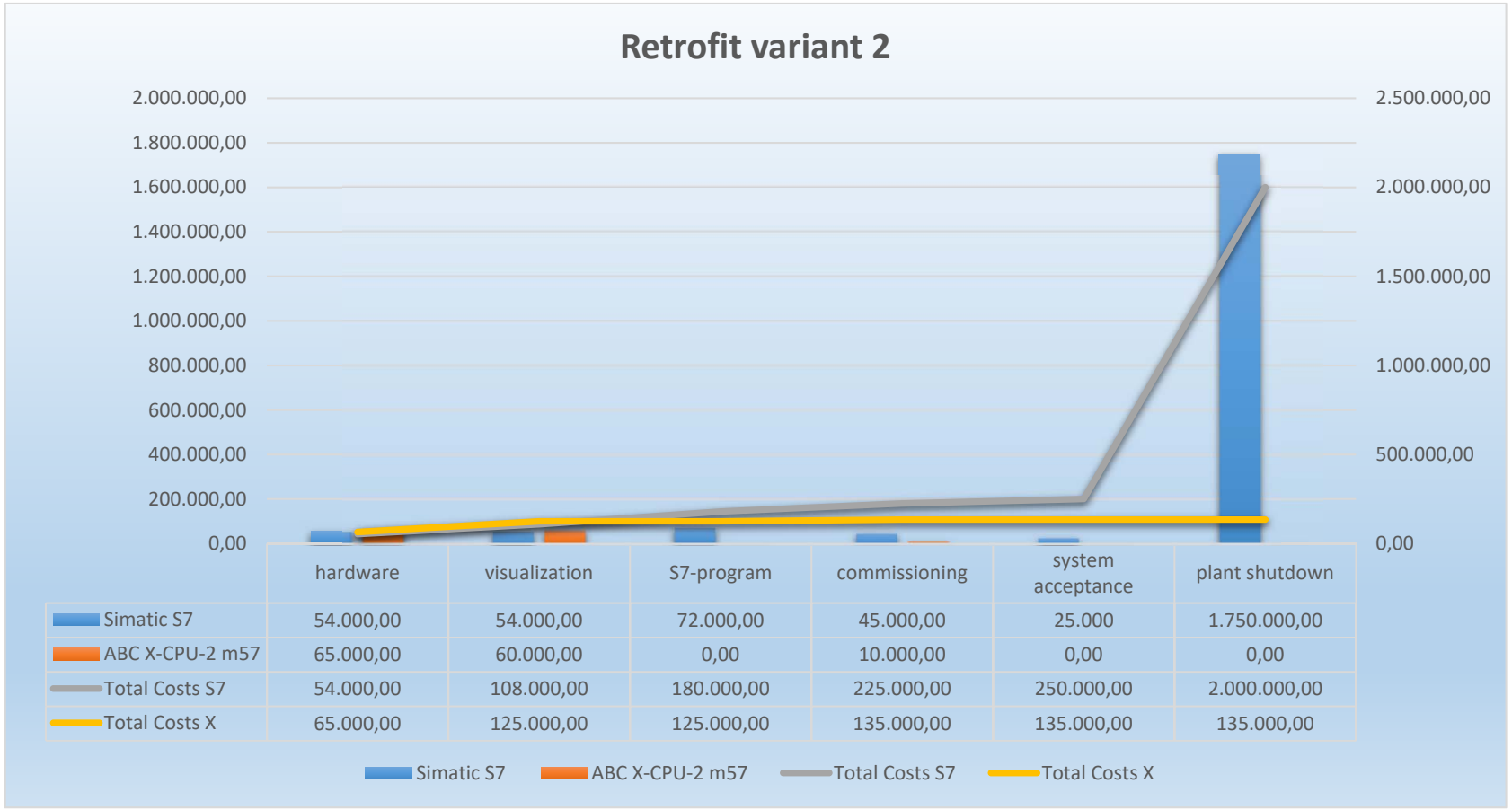
Benefits:

- Short changeover times.
- Existing and production-reliable S5 program may be kept and even extended.
- Shorter cycle times.
- Ethernet interface on board.
- Replacements and customisations may be impelemented in STEP7.
- New visualisation system, e.g. WinCC flexible, may be connected in parallel to the existing VISU.

Services

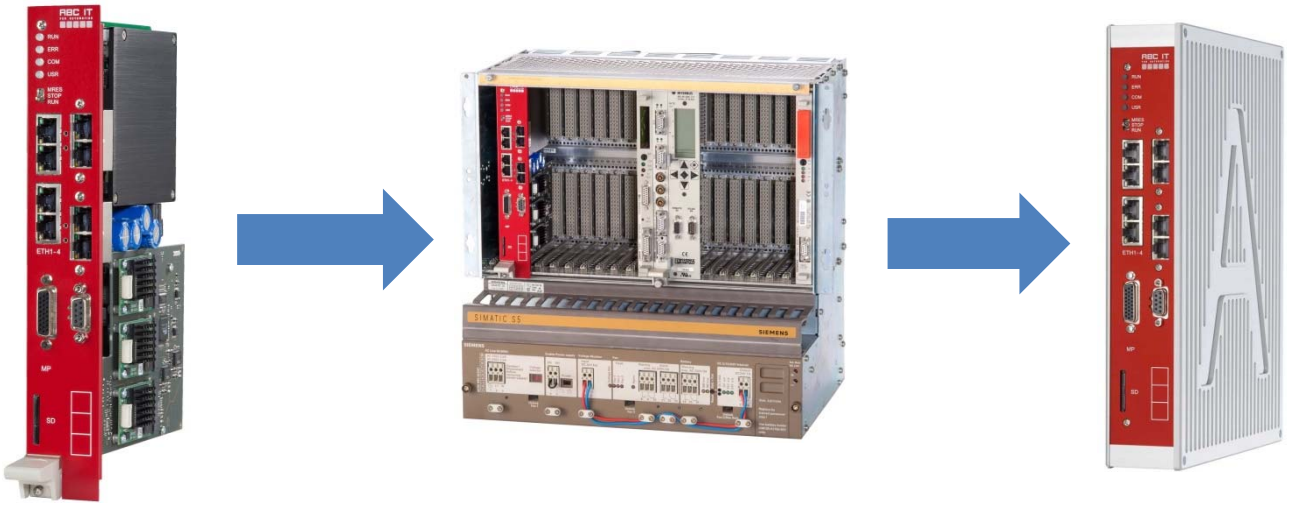
- Creation of modernisation concepts for old system controls.
- Support with the implementation of retrofit.
- Consulting and implementation in the fields of software development, network engineering and databases.
- We are able to offer industrial seminars, e.g. component group training for X-CPU.

Cost example



	hardware	visualization	S7-program	commissioning	system acceptance	plant shutdown
Simatic S7	54.000,00	54.000,00	72.000,00	45.000,00	25.000	1.750.000,00
ABC X-CPU-2 m57	65.000,00	60.000,00	0,00	10.000,00	0,00	0,00
Total Costs S7	54.000,00	108.000,00	180.000,00	225.000,00	250.000,00	2.000.000,00
Total Costs X	65.000,00	125.000,00	125.000,00	135.000,00	135.000,00	135.000,00

ABC components



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