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Document Title:	Interfacing of PLC Systems with FESA Based Front-End Systems
Project Name:	
Description:	Information about PLC systems to be interfaced to FESA-based front-end systems, using the frameworks SILECS framework (former IEPLC).
Division/Organization:	CSCOIC
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1. General Requirements

Communication of FESA-based front-end systems with equipment's embedded PLCs will be implemented by the SILECS framework (former IEPLC).

Communication is via TCP/IP Ethernet. Each PLC has to provide at least one TCP/IP Ethernet network interface for connection to the controls network, to be used for communication to/from the FESA-based front-end systems.

Each PLC should provide spare space for adding at least two additional PLC I/O modules.

If safety functionality is related to the PLC, spare space for 2 additional failsafe PLC I/O modules has to be provided.

2. PLC Components


The Technical Guideline F-TG-C-02e (Equipment Control Interfaces) [1] lists in appendix C PLC components to be used in interfacing to FESA front-end equipment control in the GSI/FAIR control system. The list in the Technical Guideline F-TG-C-02e is extended by the systems listed below in this Technical Note.

The PLC type list below will be modified due to the evaluation progress within the project, and the SIEMENS product life cycle and compatibility to the CERN/GSI frameworks SILECS/FESA. The current state of the list can always be obtained at the GSI/FAIR control system group.

S7-300 central PLC systems

1	S7-300 CPU	CPU 315-2 PN/DP, 0,385MB	6ES7315-2EH14-0AB0
2	S7-300 CPU	CPU 317F-2 PN/DP, 1,5MB	6ES7317-2FK14-0AB0
3	S7-300 CPU	CPU 317-2 PN/DP, 1 MB	6ES7317-2EK14-0AB0
4	S7-300 CPU	CPU 319-3 PN/DP, 2 MB	6ES7318-3EL01-0AB0
5	S7-300 CPU	CPU 319F-3 PN/DP 2,5 MB	6ES7318-3FL01-0AB0
6	S7 CP	CP 343-1 Advanced	6GK7343-1GX31-0XE0

Table 1: S7-300 PLC CPUs and CPs

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ET200M- Remote I/O System

1	ET200M Interface	IM153-4 PN IO HF	6ES7153-4BA00-0XB0
2	DI 32	SM321, 32DI, DC24V	6ES7321-1BL00-0AA0
3	DI 16	SM 321, 16 DC 24V,	6ES7321-1BH02-0AA0
4	DI 16 Interlock	SM 321, 16*DC 24V, diagnostic capable	6ES7321-7BH01-0AB0
5	DO 32	SM322, 32DO 24V DC, 0,5A	6ES7322-1BL00-0AA0
6	DO 8 Interlock	SM 322, 8 DA, DC 24V, 0,5A	6ES7322-8BF01-0AB0
7	DO 16	SM 322, 16 DO, 24V DC, 0.5A,	6ES7322-1BH01-0AA0
8	AI 8 Standard	SM331,8AI,+/-5/10V,1-5V,+/-20MA,0/4-20MA	6ES7331-7NF10-0AB0
9	AI Thermocouple	SM331 8 AI Thermocouple / 4 AI PT100	6ES7331-7SF00-0AB0
10	AI PT100	SM331 8AI 13BIT U, I, PT100, WIDERSTAND, NI100, NI1000, LG-NI1000, PTC, KTY	6ES7331-1KF02-0AB0
11	AO 2 U/I	SM322 2AA U/I 11/12 BIT	6ES7332-5HB01-0AB0
12	F-DI 12/24	SM326, F-DI 24 X DC24V, FAILSAFE	6ES7326-1BK02-0AB0
13	F-DO 8	SM 326, F-DO 8 X DC 24V/2A PM	6ES7326-2BF41-0AB0

Table 2: ET200M Remote I/O System

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For IEPLC/Silecs applications the S7-1500 series is also released:

S7-1500 central PLC systems

1	S7-1500 CPU	CPU 1512SP-1 PN, 200KB/1MB	6ES7512-1DK01-0AB0
2	S7-1500 CPU	CPU 1512SPF-1 PN, 300KB/1MB	6ES7512-1SK01-0AB0
3	S7-1500 CPU	CPU 1515-2 PN, 500KB/3MB	6ES7515-2AM01-0AB0
4	S7-1500 CPU	CPU 1515F-2 PN, 750KB/3MB	6ES7515-2FM01-0AB0
5	S7-1500 CPU	CPU 1516-3 PN/DP, 1MB/5MB	6ES7516-3AN01-0AB0
6	S7-1500 CPU	CPU 1516F-3 PN/DP, 1,5MB/5MB	6ES7516-3FN01-0AB0
7	S7-1500 CPU	CPU 1517-3 PN/DP, 2MB/8MB	6ES7517-3AP00-0AB0
8	S7-1500 CPU	CPU 1517F-3 PN/DP, 3MB/8MB	6ES7517-3FP00-0AB0
9	S7 CM DP	CM 1542-5 PROFIBUS DP	6GK7542-5DX00-0XE0
10	S7 CP IE	CP 1543-1 TCP/IP, IE	6GK7543-1AX00-0XE0
11	S7 CM PN	CM 1542-1 PROFINET Controller	6GK7542-1AX00-0XE0
12	S7 CM DP	SIPLUS ET 200SP CM DP	6AG1545-5DA00-2AB0

Table 3: S7-1500 PLC CPUs and CPs

ET200SP- Remote I/O System

1	Interface module ET200SP	IM 155-6 PN HF	6ES7155-6AU00-0CN0
2	DI 8	DI 8x24VDC/0,5A HF	6ES7131-6BF00-0CA0
3	DO 8	DQ 8x24VDC/0,5A HF	6ES7132-6BF00-0CA0
4	AI temperature	AI 4XRTD/TC 2-/3-/4-WIRE HF	6ES7134-6JD00-0CA1
5	AI U/I	AI 2XU/I 2-,4-WIRE HF	6ES7331-1KF02-0AB0
6	AO 2 U/I	AQ 2XU/I HF	6ES7135-6HB00-0CA1
7	F-DI 8	F-DI 8X24VDC HF	6ES7136-6BA00-0CA0
8	F-DO 4	F-DQ 4XDC 24V/2A	6ES7136-6DB00-0CA0

Table 4: ET200SP Remote I/O System

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For local HMI solutions the devices within the following list are preferred.

Local HMI Panels

1	TP700 Comfort	6AV2124-0GC01-0AX0
2	TP900 Comfort	6AV2124-0JC01-0AX0
3	TP1200 Comfort	6AV2124-0MC01-0AX0
4	TP1500 Comfort	6AV2124-0QC02-0AX0
5	TP1900 Comfort	6AV2124-0UC02-0AX0
6	TP2200 Comfort	6AV2124-0XC02-0AX0
7	SIMATIC IPC 277D	6AV7881-.A.0.-...0
8	SIMATIC IPC 477D	6AV7240-.....-....
9	SIMATIC IPC 677D	6AV7260-.....-....

Table 5: Local HMI Panels

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3. REFERENCES

- [1] F-TG-C-02e, Technical Guideline “Control System Equipment Interfaces”,
<https://edms.cern.ch/document/1171994>