SIEMENS

TIA Portal Application Awards - 2012
PCT Engineered Systems

Company Name: PCT Engineered Systems

Location of Application: 8700 Hillandale Rd., Davenport, Iowa 52806

Website: www.teampct.com

Key Business Activities: Systems Integrator OEM for BroadBeam™ Electron Beam Processors

Name of Application: EP40770

Use of the TIA Portal programming environment has cut programming time by as much as 30% over previous Siemens revisions and over some competitors. The ability to quickly switch between integrated HMI, PLC and network programming in one simple environment has saved countless hours in the programming and startup stages.

Description of Application: Control program for BroadBeam™ EP Series Electron Beam Processor. This is the first of our BroadBeam Electron Beams we have built using TIA Portal. Previously we used Step7 V5 when using a Siemens PLC. The BroadBeam Electron Beam processor delivers a high voltage (250kV) stream of electrons into a moving web of plastic, cardboard, metal, etc. depending on the specific end use. The electron beam can perform a wide variety of tasks from instantly drying specialized inks for food packaging, cross linking plastics, instantly bonding adhesives and more. For this application, we have utilized not only TIA Portal, but ET200s ProfiNet Remote I/O and Safety I/O using a S7-315F processor and Step7 Safety Advanced. The PLC is networked via ProfiNet to both the Remote I/O and two Siemens MP377 HMI Panels. The HMI Panels were designed and built using WinCC V11 in TIA Portal. We are also interfacing with our customer's process line control system via ProfiBus using a CP 342-5 module.

What challenges led you to look at a new solution?
We saw a demand for both an all-in-one programming environment and a Safety I/O PLC system that protects operators against the very high voltages and potentially dangerous radiation source that is inherent in an electron beam system.

What Siemens automation products were chosen for this project and why?
• S7-315F CPU for safety
• CP 343-1 for remote Ethernet communication
• CP 342-5 for Profibus Communication to the customer control system
• Multiple ET200s remote I/O (ProfiNet) stations for localized I/O and reduced cabling
• MP 377 HMI Panels for visualization

What features in the TIA Portal addressed your project challenges?
Previously we used a separate HMI programming software package. TIA portal integrates the HMI and PLC development as well as network layout to reduce programming and maintenance time. The recent release of Step7 Safety Advanced for TIA Portal allowed us to use a Safety PLC and Safety I/O to ensure that our system met the required safety standards.

How has your business improved?
With the TIA Portal's integrated PLC and HMI design our design time was reduced. Also, our intention is to standardize on this hardware and software combination to enable quick startups of future machines. The increased efficiencies have a positive effect on PCT profitability and the reduced startup time enables our customers to more quickly realize a return on their investment.

Project Edit View Insert Online Options Tools Window Help

Save project

LE50120 ▶ PLC_1 [CPU 315F-2 PN/DP] ▶ Program blocks ▶ Main_Safety [FB900]

Project tree

Devices

- RACK_FLT [OB86]
- I/O_FLT1 [OB82]
- I/O_FLT2 [OB83]
- PROG_ERR [OB121]
- MOD_ERR [OB122]
- Analog_In_Scaling [FC1]
- Analog_Out_Scaling [FC2]
- AutoCondition_HV [FC12]
- AutoConditioning_Beam [FC13]
- C_to_F_INT_INT [FC500]
- CGs_IG [FC3]
- Customer_Comms [FC16]
- Faults [FC8]
- Faults_A [FC9]
- Faults_B [FC10]
- Faults_C [FC11]
- Filament_Current_Calc [FC6]
- HV_Ramp [FC550]
- HVPS_Calculations [FC7]
- HVPS_Control [FC5]
- Inerting [FC14]
- NWL_Parameter_Calc [FC17]
- Processor_OpenClose [FC15]
- Vacuum [FC4]
- X-Y [FC530]
- CG_Calc [FB30]
- A_Faults [DB2]
- AC_Data [DB5]
- B_Faults [DB3]
- C_Faults [DB4]
- CGA_Calc_DB [DB30]
- CGB_Calc_DB [DB31]
- CGC_Calc_DB [DB32]
- HMI [DB1]
- NWL_Parameters [DB10]
- Main_Safety [FB900]
- Main_Safety_DB [DB900]

Details view

Name

Interface

	Name	Data type	Offset	Default value	Visible in ...	Comment
1	▼ Input					
2	<Add new>				☐	
3	▼ Output					

No trigger applied.

ACK_GL
EN   ENO

FALSE
%M9.0
"Fault_Reset_Req" — ACK_GLOB

"Fault_Reset_Req"   %M9.0   Fault Reset Request

Network 2: EStop safety relay

EStop safety relay

%DB902
"ESTOP1_DB"
ESTOP1
EN   ENO
                         TRUE
                       Q — #EStop_OK

%I10.0   %I10.2   %I39.2
"ESTOP_CTRL_   "ESTOP_REMOTE_   "ESTOP_REMOTE_   #EStop_Relay_1_   #EStop_Relay_2_
ENC_PB"   1"   2"   Error   Error
                                                                              E_STOP   Q_DELAY
                                                                                        ACK_REQ
                                                                                        DIAG
                         TRUE — ACK_NEC
                      FALSE
                      %M9.0
              "Fault_Reset_Req" — ACK

                         T#0ms — TIME_DEL

100%

Properties   Info   Diagnostics

| General | Cross-references | Compile | Syntax |

	Message	Date	Time
⚠	Do you want to go offline?	7/31/2012	11:13:08 AM
⚠	Do you want to go offline?	7/31/2012	1:21:08 PM
✔	The project LE50120 was saved successfully.	7/31/2012	1:25:25 PM
✔	▼ Start downloading to device.	7/31/2012	1:25:37 PM
✔	▼ PLC_1	7/31/2012	1:25:37 PM
✔	Faults_B (FC10) was loaded successfully.	7/31/2012	1:25:52 PM
✔	Vacuum (FC4) was loaded successfully.	7/31/2012	1:25:52 PM
✔	Loading completed (errors: 0, warnings: 0).	7/31/2012	1:25:54 PM

◀ Portal view   Overview   Main (OB1)   Faults_B (FC...   Default tag t...   Watch table_3   Vacuum (FC4)   Main_Safety ...   ✔ Loading completed (errors: 0, warnings...

Testing

Options

CPU operator panel
No data available

Call environment
No trigger applied.
Change

Breakpoints
☐ Test mode
☑ Enable output in run
Breakpoints cannot be used, because

PLC register
BR   CC0   CC 1
OV   OS   OR lo
STA   RLO   /FC

Accumulator 1   Accumulator 2

Address reg. 1   Address reg. 2

Call hierarchy
No call path available

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SIMATIC NET   SIMATIC NET

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6ES7 390-1AE80-0AA0