1910603

by Benjamin Brickle

FILE	17595_BENJAMIN_BRICKLE_1910603_179198_1789574905.PDF (3.31M)		
TIME SUBMITTED	03-MAY-2021 12:06PM (UTC+0100)	WORD COUNT	29682
SUBMISSION ID	151405025	CHARACTER COUNT	158593

Course: HNC Electrical and Electronic Engineering

Module: SGEE4005 Instrumentation and Integrated Automation Systems

Assignment: 2. Integrated Automation System

Name: Ben Brickle

University Number: 1910603

Date Submitted: 03/05/21

Word Count: 2738

Good Structure

Contents

1) Research 4

2) System Overview and Operation 6

3) Health and Safety, Maintenance and Reliability Requirements 13

4) System Design Adaptation 16

5) Conclusions and Recommendations 26

6) Team Working 27

7) Citation List 28

8) Appendix 30

Table of Figures

Figure 1- CIM system layout (Davies, 2021) 6

Figure 2- CIM system PLC/HMI connections 7

Figure 3- Pneumatic PLC station 8

Figure 4- Pneumatic station 8

Figure 5- Proximity sensors on visual station 9

Figure 6- Hydraulic station 10

Figure 7- Hydraulic PLC and schematic drawing 10

Figure 8- Linear drive schematic and HMI 11

Figure 9- Mitsubishi robot 11

Figure 10- CIM system risk assessment 13

Figure 11- Engineer- Pneumatic station HMI 14

Figure 12- Creating 'Get' bits for Pneumatic tags in PLC 101 16

Figure 13- 'Finish can pick' command parallel PROFINET alongside hardwired 17

Figure 14- PLC 104 Process station, 'Process busy' command in hardwired connection and PROFINET, in parallel 17

Figure 15-'Go Online' PROFINET connection for PLC 106 18

Figure 16- Finish can pick, handshake signal from Linear Drive PLC (106) to Main (PLC101) 18

Figure 17- Main CIM showing counts for linear drive PLC 19

Figure 18- Linear drive robot counts properties 19

Figure 19- Adapted robot arm 20

Figure 20- Robotic arm properties 20

Figure 21- 'Air supply healthy' HMI indication 21

Figure 22- Put bit re-addressed to air supply healthy 21
Figure 23- Air supply interlock, via PROFINET put bit. 22
Figure 24- IO link HMI screen 22
Figure 25- Adapted robot screen 23
Figure 26- Mitsubishi robot maintenance HMI 23

1) Research

Industry 4.0 is often described as the industrial revolution of the 21st century and is effectively the fourth industrial revolution. The phrase was initially used by the German Federal Ministry of Education and Research, with the aim of ensuring that German manufacturing sustains its lead globally. Klaus Schwab, founder of the World Economic forum, states that 'the technological revolution will fundamentally alter the way we live, work and relate to one another' (2016). Industry 4.0 will make revolutionise industry, upgrading the quality of hardware, the level of communication within software and how the two can work together to create much more effective and complex systems. As there is no definition for industry 4.0, the extent of it can be interpreted in many ways. Developments into the way data is gathered and used, emerging technologies and robotics/automation are all a part of industry 4.0, amongst a host of other concepts (Ustundag, 2018). Fanuc, an electronics company in Japan have been able to deploy a 'lights-out' factory, because of continuous investment into automation. This factory can run for prolonged periods without human intervention, improving profitability and reduced costs for the company, which is likely to be followed by other large companies (Fogg, 2020).

Manufacturing systems can be developed greatly following the vague guidelines of industry 4.0. As suggested above, developments into data collection and use, networking and digital communications can all be adapted and utilised in industry. Whilst there are many potential cyber security risks attached, firms may also investigate the Internet of Things (IOT) to further develop production (Holler, 2014). These developments can also assist production with regards to stronger maintenance schedules, because of smart instrumentation, or quicker networking protocols to update faults or error codes. Features such as SMART instrumentation could be used, to predict machine failures (Yokogawa, 2017). Other protocols such as Foundation Fieldbus or a modern distributed control system (DCS) can be used as a method of connecting multiple pieces of hardware to each other, creating a much more efficient system (Moon, 2018).

The way in which hardware communicate can be described as 'machine-to-machine' or (m2m). This allows hardware to communicate, allowing data acquisition and reacting to this data autonomously, without any need for human contact. These systems are considered far more reliable, and eliminate human error, performing tasks immensely accurately and with a high level of repeatability. Data acquisition can occur in real time, allowing manufacturing systems to react instantly to improve output and efficiency continuously, for long periods (Anton-Haro, 2015). Manufacturing systems may use analog or digital measuring devices and

be part of a much larger scale system. Technologies such as SCADA have been used for data acquisition and control but may slowly be phased out into more innovative m2m communication methods. Artificial intelligence or machine learning could be used as a replacement for SCADA and DCS in the future, as manufacturing systems demand faster, more accurate processes, where artificial intelligence can predict machine behaviour or system output and adjust accordingly (Shea, 2019).

Further developments could be made to support modern and efficient manufacturing systems, including artificial intelligence and improved networking protocols. Investment into products and technology can improve the usability and functionality of wearable or portable technology. Smart watches or tablet computers could be used for personnel to continuously monitor plant, with instant updates of process or maintenance requirements (Cb Insights, 2019). Developments into cellular networks such as 5G as well as computer-based networking such as PROFINET will constantly improve the speed and reliability of this information being used. Andreas Muller, 5G expert at Bosch described development of 5G for industry as a 'standard of superlatives,', suggesting it provides a competitive advantage for firms, and provides more flexible production with easy conversion. (2019). Cloud storage was estimated to be worth $46 billion in 2019 and is being increasingly used by manufacturing companies to reduce hardware on-site, whilst still retaining instant access to mass amounts of data (Rake, 2020). These new technologies can be easily fitted to current systems, such as a production line. Smart instrumentation could be fitted alongside robots, to perform all process related tasks. Data could be easily transferred via methods discussed and can continually be updated and adjusted accordingly. With the assistance of Intel, automobile maker Audi claim they have had a reduction of 30-50% in labour costs in their Neckarsulm factory because of implementing Industry 4.0 in their factories (Intel, 2021).

This is an excellent overview of Industry 4.0 and M2M systems

2) System Overview and Operation

The CIM system is capable of moving/placing objects, via several smaller subsystems which are all combined via networking links. The system requires a set point (SP) to be made on the local HMI, from which it can start its process and meet the process requirements. Various instrumentation and sensors are used to provide feedback, which is controlled by their respective PLC's. The subsystems within are all controlled by their own PLC's, and can therefore be segregated as such. All communications have been hardwired and placed in parallel with data block connections as part of a later section, improving the M2M communications.

Grocer's apostrophe

All PLCs are connected to the master via Get/Put signals, and hardwired connections. Communications between PLC's are generally performed through the main block inside the main PLC and can be considered to have none/very few connections between themselves.

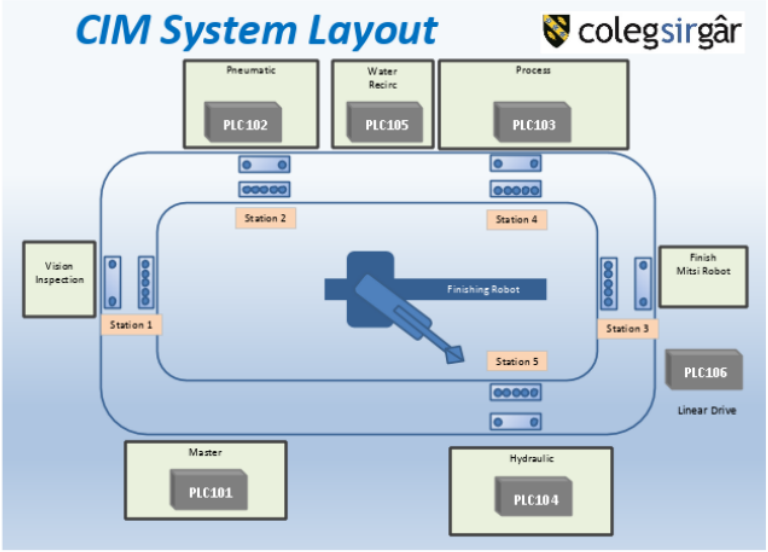


Figure 1- CIM system layout (Davies, 2021)

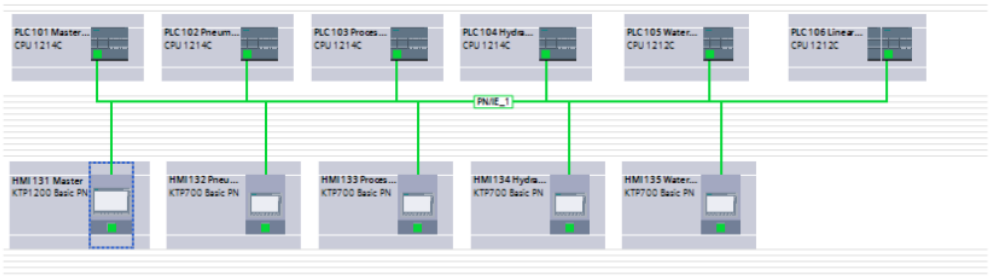


Figure 2- CIM system PLC/HMI connections.

Main PLC (101) is the master, and effectively controls all subsystems. Several buttons are available on the main control panel to drive the process. The main block inside this PLC is the master controller, and process information from itself and all other PLC's to control the majority of the system.

Incorrect, this is the hydraulic station PLC, read the label etched just below the PLC 104, see figure 8

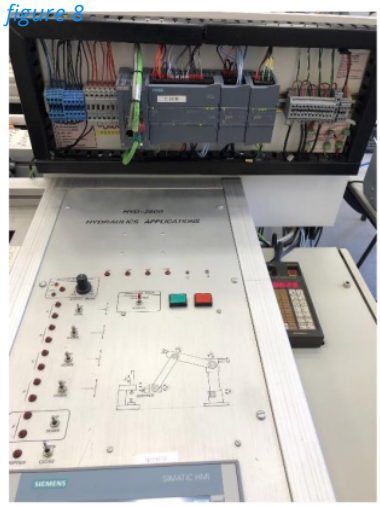


Figure 3- Main PLC (101) and control panel

The Pneumatic PLC (PLC-102) is the initial section of the system. Pneumatics are used to place the object onto the conveyor belt. A healthy air supply interlock was also added to ensure the system can only work when there is a suitable air pressure to run. This will reduce likelihood of harm to plant and personnel.

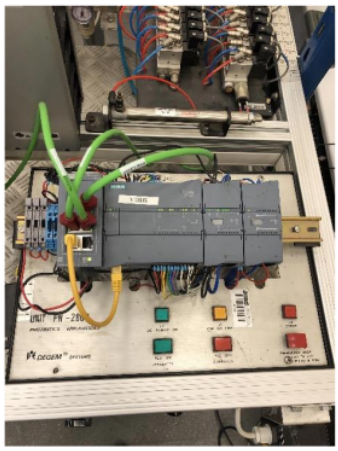


Figure 4- Pneumatic PLC station.

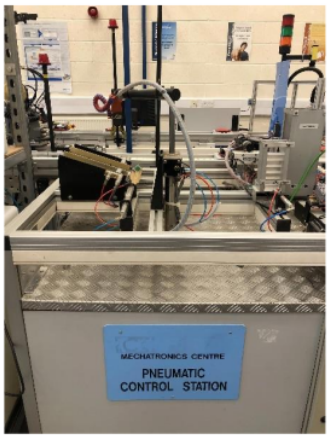


Figure 5- Pneumatic station

The visual station will determine the position of the objects, and count as the pass a set-reference point on the conveyor. The set-points and variables set on HMI's will determine how this information is interpreted and used. Five proximity sensors are used, and can determine the position of metal objects that pass through. The sensors are part of the binary system the CIM uses to determine the location and output of the system. If a product is suitable, it can progress to the process station, if unsuitable then it will proceed to the finish station where it can be discarded.

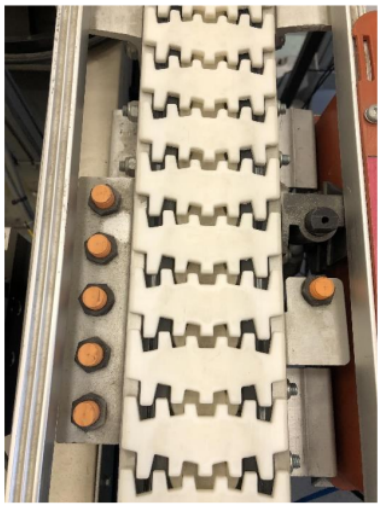


Figure 6- Proximity sensors on visual station

The hydraulic station presses components together, once placed onto the unit by the Mitsubishi robot. This is controlled by PLC-104. The PLC has a digital and analog module, providing feedback to the system. This station uses a variety of axis controllers and sequencers to perform these tasks, programmed from OB123-127 throughout PLC-104 in function-block logic. Each axis is shown in diagram, fig.8.

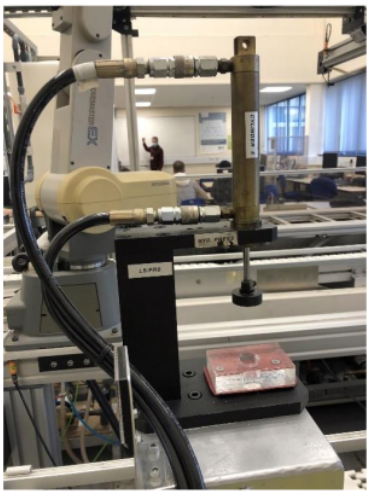


Figure 7- Hydraulic station

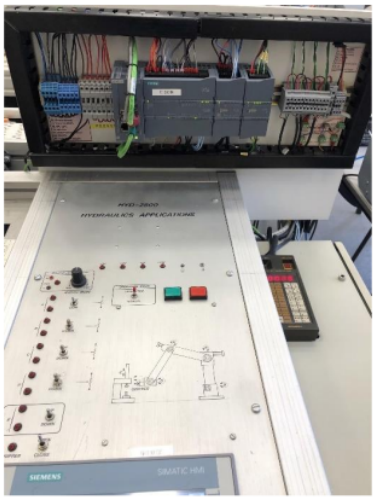


Figure 8- Hydraulic PLC and schematic drawing

The set-point as controlled by the HMI will control the action of the robot. The Linear drive PLC (PLC-106) communicates to PLC-101 (main) and determines what action is required. The PLC uses a variety of IO such as proximity limit switches to determine its location, which provides location feedback. This can then be used to calculate errors and its own speed controller.



Figure 9- Linear drive schematic and HMI



Figure 10- Mitsubishi robot

The process station (PLC-103) uses the linear drive and robotic arm to clean and treat the objects via several washing/chemical processes. A variety of instruments and control systems are used, such as FC531 and LC541 to ensure the process remains a good standard. This system uses the larger robotic arm to place components into the specific tanks as required.

The water recirculation PLC (105) has two water storage tanks. Each has a variety of instrumentation such as level, temperature and flow via IO-link. The levels are controlled via the PLC using instrumentation as feedback, control blocks and solenoid valves.

All PLC's and HMIs are configured using Siemens' TIA portal, using ladder and SCL logic. As discussed, all PLCs are connected via hardwire connections of MODBUS protocol via get and put commands which have been added in section 4.

3) Health and Safety, Maintenance and Reliability Requirements

A risk assessment has been created, identifying potential hazards, their risks, existing control measures and extra measures that could be utilised to improve safety and/or reliability.

The risk assessment must be understood on all personnel working with or maintaining the CIM system. Relevant regulations have been attached to several hazards, stating that behaviour regarding that risk must obey particular regulations as required by the HSE. The Management

Hazard	Risk	Likely Occurance	Likely Severity	Risk Ratin	Control Measures	Relevant Regulations	Potential Improvements
Electricity	Personnel experiencing electric shocks or damage to plant	1	3	3	Electric components installed and maintained by competent personnel. Low voltage for control. Components stored within locked cabinet, only authorised personnel can obtain entry, cabinet has its own isolator.	Electricity at Work reg. 1989	Have all cables and components in locked enclosures.
Instrument failure	Harm to plant or personnel	1	4	4	Safety interlocks to be installed on system. System to be monitored at all times when powered. All personnel using system to be aware of 'emergency stop' if required.		Have individual instrument failure alarms. Investigate into potential for smart instruments or NAMUR failure current standards
Entanglement in robot	Injury to personnel	1	4	4	Barriers to be placed around robot at all times. Loose hair/clothing to be tied		
Loss of instrument air	Damage to plant	1	3	3	Interlocks in place to allow robot to stop safely at all times. Air pressure interlock included in system.		Investigate 'low air pressure' audible and HMI alarm
Hydraulic oil leak	Slip hazard, skin irritation	1	3	3	System to be visually inspected before use for leaks. Oil spill kit to be located near system if required. COSHH certification to be noted, and all personnel working on equipment to be aware of potential hazards. Suitable gloves to be worn when handling potentially harmful substances.	Control of Substances Hazardous to Health(COSHH) 2002. Personal Protective Equipment reg. 1992	
Stored energy in system when performing maintenance tasks	Electrocution, robot moving unexpectedly striking personnel or harming plant	1	3	3	All workers on system to be fully aware of all isolations, and be able to prove isolations before starting work.	Electricity at Work reg. 1989. Safe Isolation of plant and equipment 2006.	Have several maintenance personnel prove all isolations before task commences.
Robot drops parts	Could strike plant/personnel or create a tripping hazard	2	1	2	Barriers in place around conveyor to prevent close contact with machine. Plate in place to catch dropped items.		

Figure 11- CIM system risk assessment

of Health and Safety at Work Regulations of 1999 state that 'employers must assess risks to the health and safety of their employees arising in, or from the workshop' (2004). As the system includes several different sections, thinking of each independently may not be beneficial due to their connections via software and hardware links. Hazards such as entanglement could exist on many sections of the system, and therefore has not been isolated to one section.

Maintenance is essential for all systems, to follow legal guidelines and to also ensure efficiency and longevity of equipment. There are five engineering HMI screens, which maintenance personnel can use to access a high level of information and instrumentation/control feedback. The pneumatic screen shows the extent of feedback that can be used, showing each limit switch being made/broken, which systems are currently working etc. This can show maintenance exactly which sections are functioning correctly and which aren't, which is vital for maintenance.

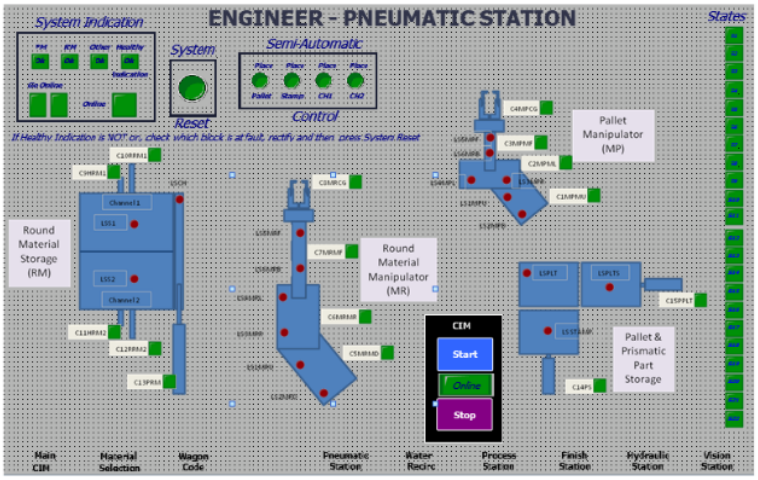


Figure 12- Engineer- Pneumatic station HMI

It may be beneficial to design a maintenance schedule, to be performed by trained personnel at regular intervals. This would include a procedure stating how each section would be tested, ensuring all critical instrumentation and mechanical sections were tested. This procedure would allow personnel to compare expected results with actual results, enabling them to quickly determine faulty components which can be replaced. This maintenance schedule should inspect all potential hazards listed in the risk assessment. This ensures that whilst

machine health is monitored, other factors such as oil levels, quality of electrical installation etc. remain to a high standard, to reduce the risk to personnel or plant. If this is kept to a high standard, machine reliability will be to a good standard, and any faults or issues will be correctly effectively, allowing the system to return to service with very little down-time. Whilst the quality of equipment is important, each task must be performed inline with government guidelines. This includes ensuring that all datasheets and records, including MSDS' are stored accordingly, ensuring that other, more specific regulatory requirements are met such as storage of materials governed by the COSHH (Control of Substances Hazardous to health) regulations (HSE, 2020).

4) System Design Adaptation

Get and Put commands can be used to create PROFINET points in Siemens' TIA Portal, in ladder logic or SCL languages. Data blocks were created in the Master PLC (101), to store information as 'bits. These were then converted to 'handshaking' commands, creating hardwired connections in parallel with their respective PROFINET equivalents.

some are words and some are reals

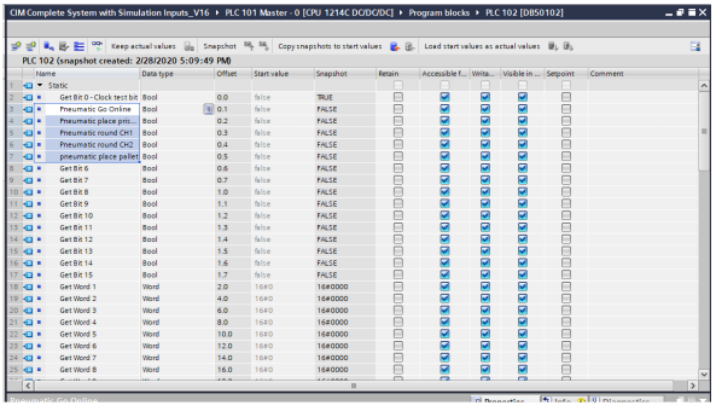


Figure 13- Creating 'Get' bits for Pneumatic tags in PLC 101

Each PLC has a 'go online' command, which is hardwired. As seen, each go online command is in parallel with an identical command, addressed as 'DB', showing that it is a PROFINET connection, with its data stored in a data block. These parallel connections are referred to as 'handshaking signals'. Several 'handshaking' signals are shown, using ladder logic and SCL.

too small to read

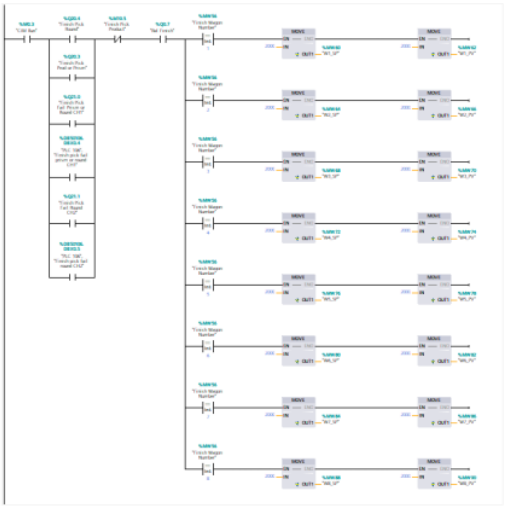


Figure 14- 'Finish can pick' command parallel PROFINET alongside hardwired.

```
30:////////////////////////////////PUT SEQUENCE////////////////////
    "CIM_Busy_Output" := 0; OR "PLC 101". "Process busy" := 0;
    "CIM_Can_Place_Output" := 1;
    IF "HMI_Place" = 1 OR "CIM_Place" = 1 THEN
        "CIM_Busy_Output" := 1;
        "next_STEP" := 31;
    END_IF;
31: //move down to mid point on conveyor
```

Figure 15- PLC 104 Process station, 'Process busy' command in hardwired connection and PROFINET, in parallel.

The New Linear drive PLC (106) also requires handshaking commands to the Main PLC (101). This was performed using a similar technique, with get and put bits.

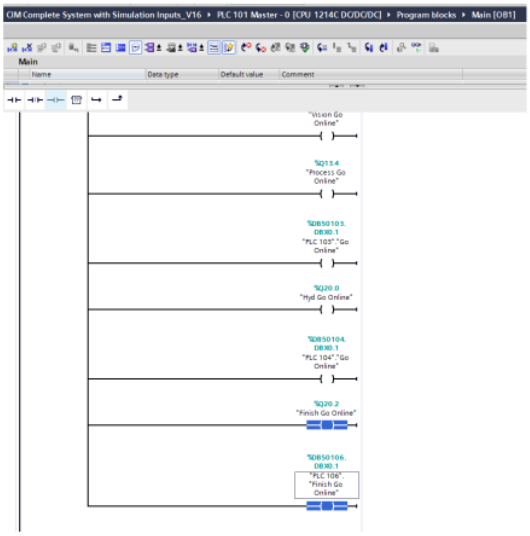


Figure 16-'Go Online' PROFINET connection for PLC 106

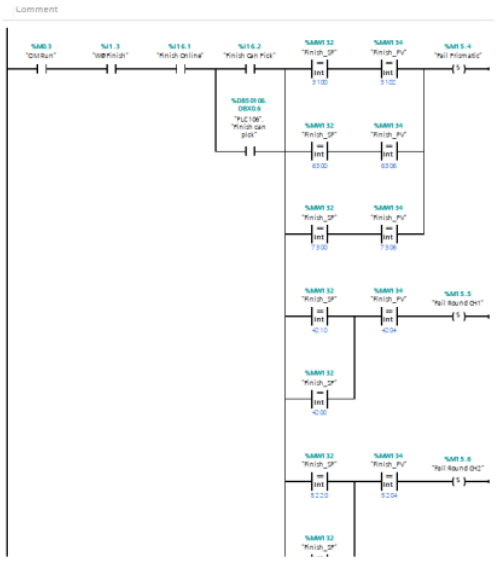


Figure 17- Finish can pick, handshake signal from Linear Drive PLC (106) to Main (PLC101)

The counts for the Linear Drive PLC were also added, in the bottom right corner, being labelled accordingly.

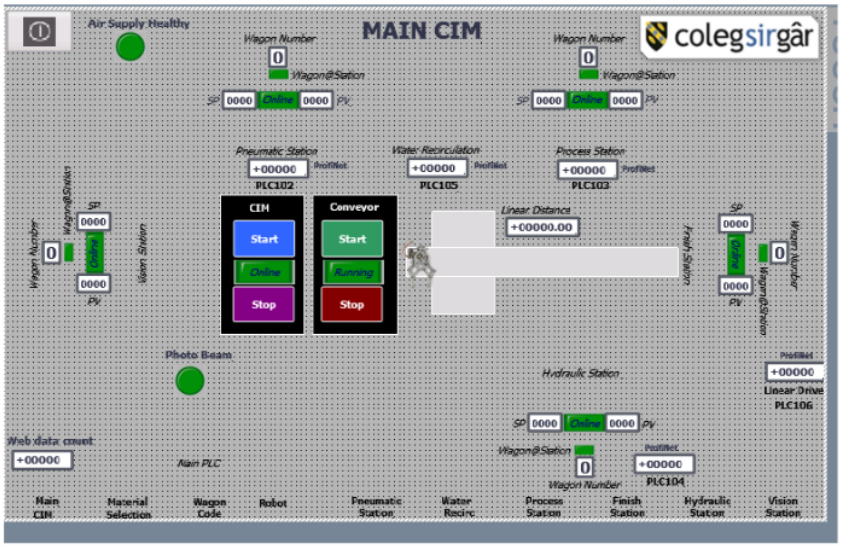


Figure 18- Main CIM showing counts for linear drive PLC

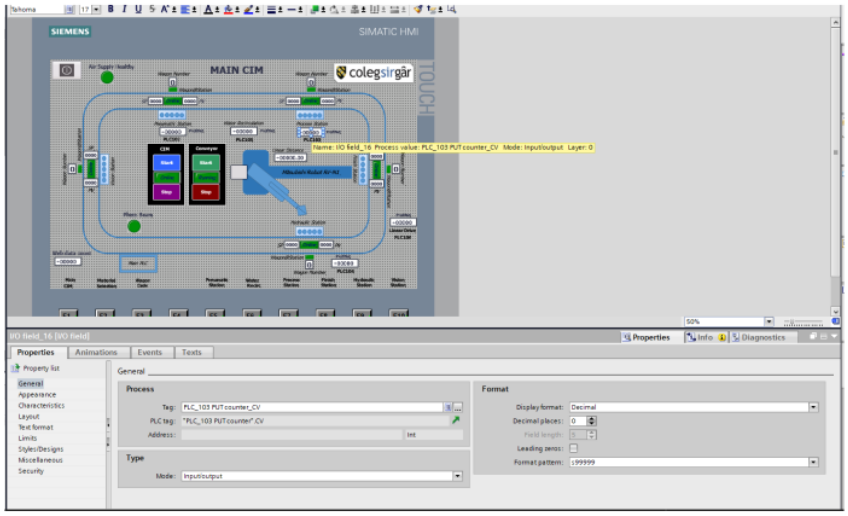


Figure 19- Linear drive robot counts properties

The robot image was adapted to provide a more realistic image. The robotic arm moves across the horizontal axis, and its path is shown by blue arrows. The arm was addressed to 'linear drive distance int'.

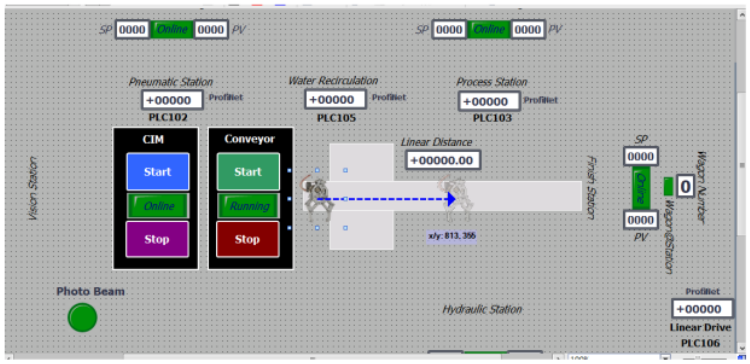


Figure 20- Adapted robot arm

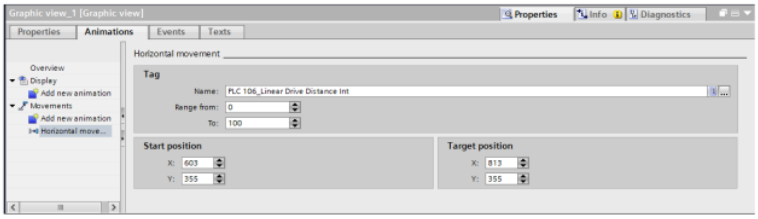


Figure 21- Robotic arm properties

An air supply interlock was added to the system. This ensures that the system will not operate unless the air supply is at a safe level. The HMI was adjusted, to include indication of the air supply's state.

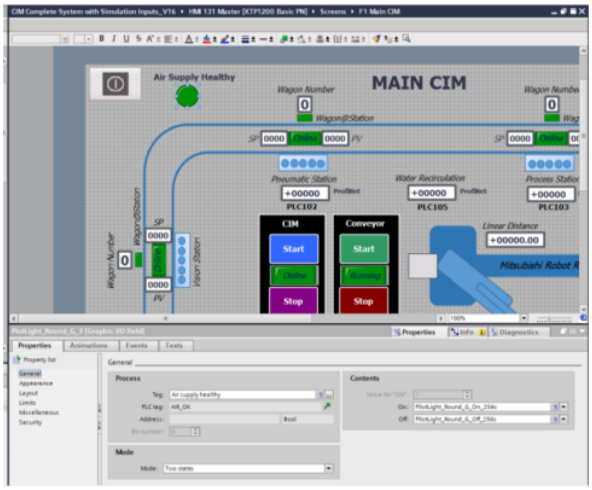


Figure 22- 'Air supply healthy' HMI indication

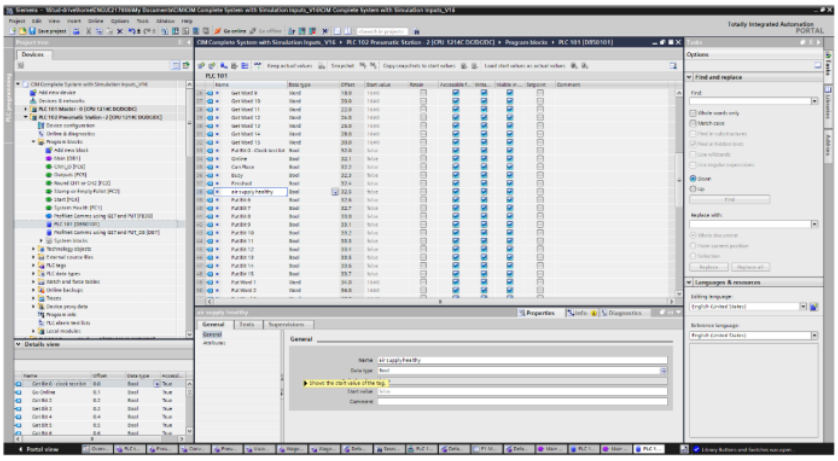


Figure 23- Put bit re-addressed to air supply healthy

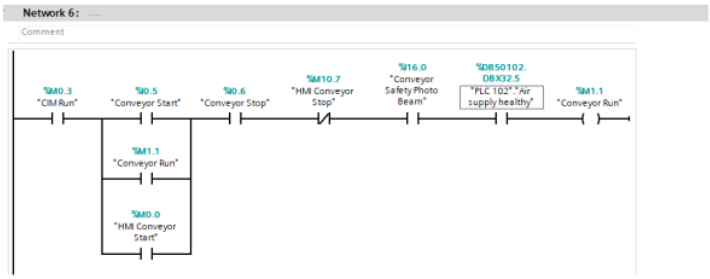


Figure 24- Air supply interlock, via PROFINET put bit.

The IO-link module had not yet been configured. The available features have been added to its own screen, labelled 'IO-Link' on the HMI for water recirculation station. This includes raw flow rate, scaled flow rate and the temperature provided by the IO-link. The Pepperl and Fuchs IO-link sensor is capable of providing far more detailed diagnostics, such as Bluetooth capability, enhanced diagnostics and other valuable process values. Once this has been configured, the screen can be further adapted to include all relevant information.

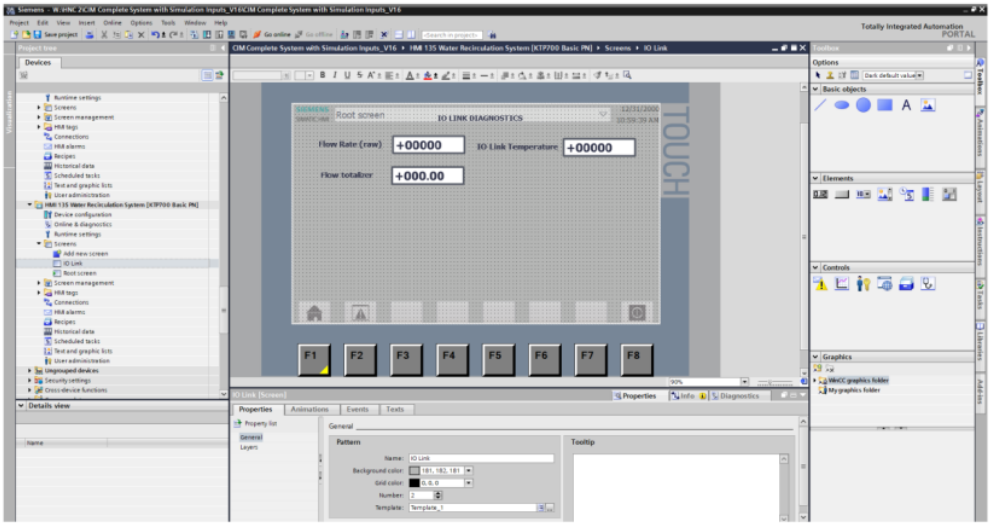


Figure 25- IO link HMI screen

Another maintenance screen was added for the Mitsubishi Robot. Limit indications were added, alongside the image adapted previously. This will show the continuous position of the robot via the animation, and whether the robot has reached its left and right limit switches via the green pilot lights. Arrow buttons have been added, to move the robot manually via the HMI screen, with their information taken from the Linear drive PLC (PLC-106) via get and put bits. They have been addressed to 'move left/right request', and the pilot lights have been addressed to the relevant limit switches. The scaled distance has also been added, to work alongside the animation included.

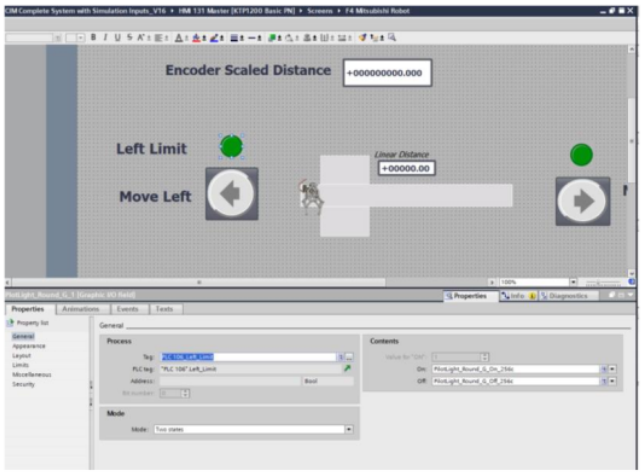


Figure 26- Adapted robot screen

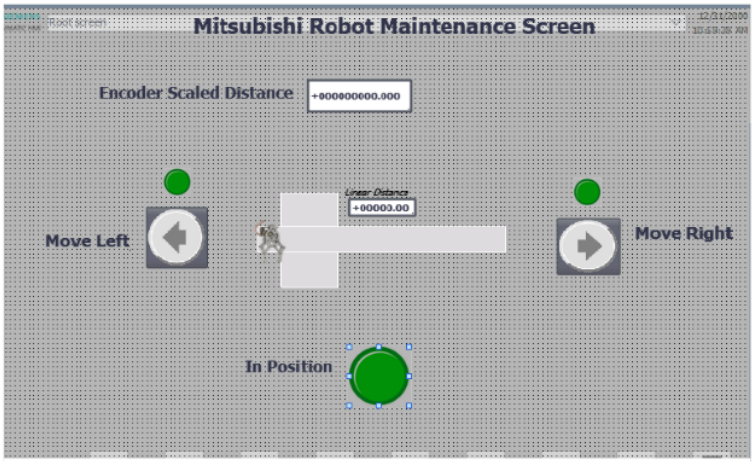


Figure 27- Mitsubishi robot maintenance HMI. Image obtained via Amazon stocklist (Amazon, 2021).

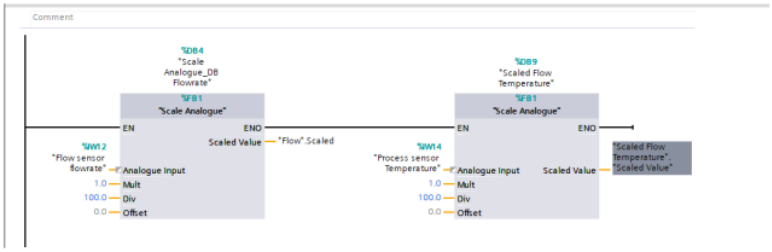


Figure 28- Scaling IO-link values



Figure 29- IO Link HMI screen

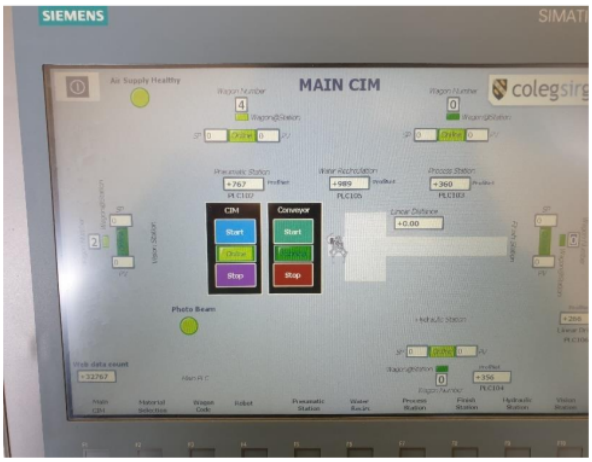


Figure 30- Main HMI showing air supply healthy and new robot animation.

A testing table was created to ensure all new/adjusted functions were tested thoroughly. Due to time constraints, the system could not be tested fully. The initial test will ensure that the system operates correctly, disregarding changes that have been made in this section. If a fault will arise after this test, fault-finding can be performed on changes that have been made, rather than the entire system. Notes have been added to assist with the testing process, this will improve the likelihood of a successful testing period and improve the efficiency of the process. Two errors were encountered, one due to an addressing error and one due to a known hardware issue. The addressing error was quickly resolved, and likely caused by complacency due to time constraints.

There was time available

Test	Expected Outcome	Actual Outcome	Re-test Required	Errors found and retest results	Notes
Perform full cycle	System to cycle with HMI's changing as expected	Functioned correctly, known hardware issues noted such as vision	No	-	Watch system to determine whether any factors have been missed for risk assessment
Monitor PLC-106 count status on Main HMI	Count number to increase as system operates	Counts increased to show communication	No	-	HMI-131, F1 screen.
Robot linear position	Robot animation to move as expected on Mitsubishi robot HMI screen	Robot moved alongside animation shown on HMI-136, with limit switches	No	-	Robot should move along horizontal axis, from 603-813. Monitor on main CIM screen and robot maintenance screen. Ensure limits have been made, and that move right/left requests function correctly
Fully test all buttons/indicators on new maintenance screens	Limits to work when expected. Left/right arrows should move robot as expected. Robot position scaled value to increase/decrease	All functioning correctly except for scaled value temperature on IO Link screen	No	Adjusted scaling block and tagging issues, functioned correctly	IO-Link screen on Water Recirc HMI (HMI-135) and robot screen (F4 on main HMI-131)
Air supply interlock'	Indicator to show green when healthy, and off when supply pressure is too low.	Once air pressure increased to approx. 0.5 Bar, air supply healthy indicator illuminated	No	-	Ensure indicator functions on main HMI screen. Reduce air pressure to ensure interlock functions correctly and shows accordingly on HMI.
IO-Link screen capability	All values on IO-Link HMI screen should change as expected in line with process changes for recirculation system	Expected values increased, totaliser failure due to hardware issue	No	-	Use water recirculation station, monitoring flow and associated values on screen (HMI-135>IO Link). Known issue with totaliser. Limited IO link capabilities with current configuration, screen space left for further adaption

Did this prevent the conveyor from moving?

Figure 31- System adaptation testing table

5) Conclusions and Recommendations

Research was performed to provide a good understanding of all relevant concepts, especially machine-to-machine communications which was crucial for including software connections in parallel with hardwired contacts for each PLC's communications. Before undertaking work on the system, a risk assessment was performed to ensure that all personnel fully understood the potential hazards whilst working on the CIM system, and the existing controls in place to reduce the risk to themselves or the machine. Several improvements were made to the CIM system to improve the functionality and usability. Several maintenance screens were added, which alongside the existing maintenance screens provide a solid basis for fault-finding and maintenance work on the machine, providing many relevant machine factors on the HMI screens located at each station. Extra safety features were added such as an 'air supply healthy' interlock, to protect the machine from moving and harming itself or personnel if the air pressure dropped or had failed.

Several improvements could be made on the system. Alongside a configured IO-link module, further SMART improvements could be made. This may include smart instrumentation for the process station, ensuring a more reliable and stable system with a far higher level of diagnostics and communication capability. The existing Mitsubishi Movemaster EX RV-M1 robot could also be improved. The datasheet states that the robot is configured and used with a RS-232 connection and 'teaching box' and offers very low-level technology in comparison with newer products which are progressing the Industry 4.0 concept. More capable robots with newer technologies such as wireless configuration, with more sensitive proximity sensors or a higher level of control with range of movement and speed could be investigated to future-proof this design and improve the smart functionality of the system.

6) Team Working

The team consisted of the author, Jack Evans and Simon Yau. Each member played an active role in ensuring all tasks were completed to a good standard. The brief was followed, with each member ensuring that the tasks were understood fully before they were attempted. Several screens were used to make cross-referencing between TIA portal and the assignment brief quicker and easier. Each member rotated through the roles of creating PLC tags, designing HMI screens and adjusting the program. This was to ensure fairness and reduce likelihood of complacency or errors. All decisions were made as a team, with all agreeing on which improvements to make and how they should be performed.

Wide Range of Sources Correct method of listing.

7) Citation List

Amazon, 2021. *Amazon.* [Online]
Available at:
https://ctemedia.s3.amazonaws.com/gs/images/product_galleries/780/R700_claw_72dpi.jpg
[Accessed April 2021].

Anton-Haro, C., 2015. Machine-to-Machine Communications. In: *Machine-to-Machine Communications.* Cambridge: Woodhead Publishing, pp. 1-10.

Cb Insights, 2019. *CB Insights.* [Online]
Available at: https://www.cbinsights.com/research/future-factory-manufacturing-tech-trends/
[Accessed 8 April 2021].

Davies, R., 2021. *CIM System Layout,* Llanelli: Coleg Sir Gar.

Fogg, E., 2020. *Machine Metrics.* [Online]
Available at: https://www.machinemetrics.com/blog/lights-out-manufacturing
[Accessed 8 April 2021].

Holler, J., 2014. From Machine-to-machine to the internet of things. In: *From Machine-to-machine to the internet of things.* Oxford: Elsevier, pp. 14-17.

HSE, 2004. *HSE-Health and safety in engineering workshops.* [Online]
Available at: https://www.hse.gov.uk/pUbns/priced/hsg129.pdf
[Accessed 19 April 2021].

HSE, 2020. *HSE- COSHH.* [Online]
Available at: https://www.hse.gov.uk/coshh/
[Accessed 19 April 2021].

Intel, 2021. *Audi-Automated Factory.* [Online]
Available at: https://www.intel.co.uk/content/www/uk/en/customer-spotlight/stories/audi-automated-factory.html
[Accessed 8 April 2021].

Moon, I., 2018. *Advances in Production Management Systems.* Seoul, Advances in Production Management Systems (APMS), pp. 64-67.

Muller, A., 2019. *5G at Bosch* [Interview] (9 October 2019).

Rake, V. K., 2020. *Allied Market Research.* [Online]
Available at: https://www.alliedmarketresearch.com/cloud-storage-market
[Accessed 8 April 2021].

Schwab, K., 2016. *Industry 4.0,* s.l.: World Economic Forum.

Shea, S., 2019. *Internet of Things Agenda*. [Online]
Available at: https://internetofthingsagenda.techtarget.com/definition/machine-to-machine-M2M
[Accessed 8 April 2021].

Ustundag, A., 2018. *Industry 4.0: Managing the digital transformation.* Cham, Switzerland: Springer International Publishing.

Yokogawa, 2017. *Smart instruments and device diagnostics. How well is your plant using information?*. [Online]
Available at: https://www.yokogawa.com/library/resources/media-publications/smart-instruments-and-device-diagnostics-how-well-is-your-plant-using-information/
[Accessed 8 April 2021].

8) Appendix.

1. SPECIFICATIONS

2. SYSTEM OF CONSTRUCTION

2.1 Overall of Construction

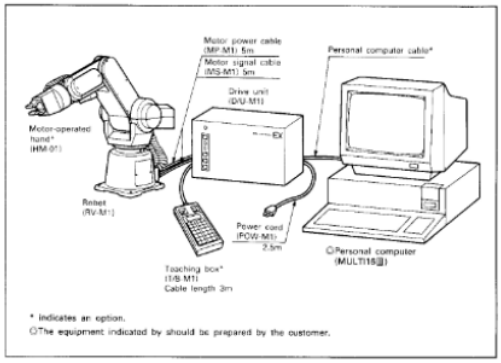


Fig. 1.2.1 Overall of Construction

Figure 32- Mitsubishi RV-M1 layout (Mitsubishi, n.d.)

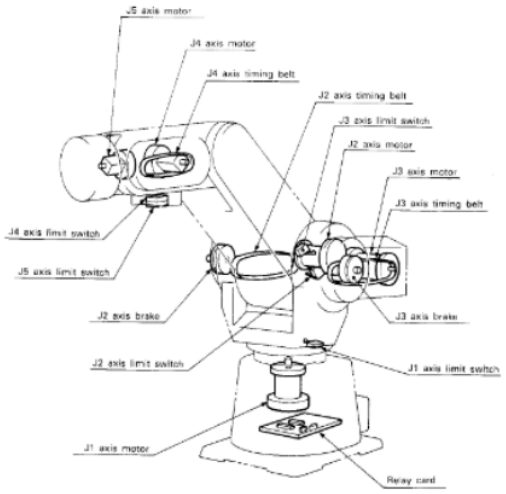


Fig. 1.3.2 Nomenclature (Internal View)

Figure 33- Mitsubishi RV-M1 axis (Mitsubishi, n.d.)

The inclusion of a program printout produces a very high plagiarism score and is to be avoided

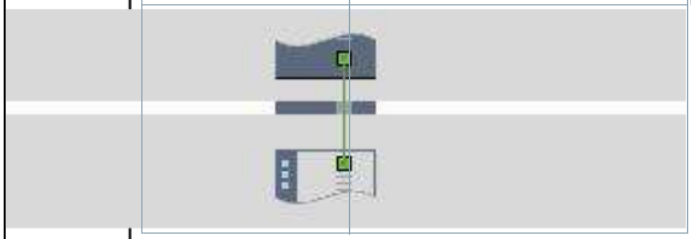
CIM Complete System with Simulation Inputs_V16 / Devices & networks

HMI 131 Master

HMI 131 Master	
General	
Name	HMI 131 Master

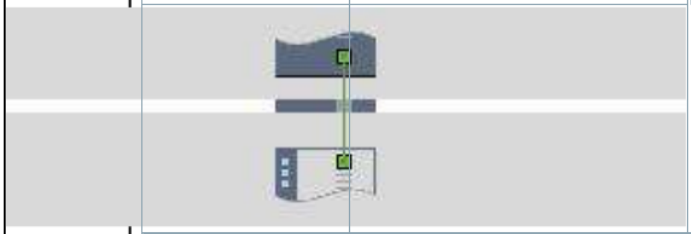
HMI_RT_2			
General			
Name	HMI 131 Master	**Device/application type**	KTP1200 Basic PN
Author	BillM	**Comment**	
General\Catalog information			
Short designation	KTP1200 Basic PN	**Description**	12.1" TFT display, 1280 x 800 pixel, 64K colors; key and touch operation, 10 function keys; 1 x PROFINET, 1 x USB
Article number	6AV2 123-2MB03-0AX0	**Version**	15.1.0.0
Information			
Number of used PowerTags	0	**Memory requirements in runtime**	0
Compilation build number	0	**Date of last compilation**	
Date of last download			

PROFINET Interface_1			
General			
Name	PROFINET Interface_1	**Author**	BillM
Comment			
Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.131
Subnet mask:	255.0.0.0	**Use router**	False
Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	hmi 131 master	**Converted name:**	hmixa131xamasterd656
Device number:	0		
Advanced options\Printing full menu\General			
Name	Port_1	**Author**	BillM
Comment			
Advanced options\Printing full menu\Port interconnection\Local port:			
Local port:	HMI 131 Master.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Advanced options\Printing full menu\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

Port_1			
General			
Name	Port_1	**Author**	BillM
Comment			
Port interconnection\Local port:			
Local port:	HMI 131 Master.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

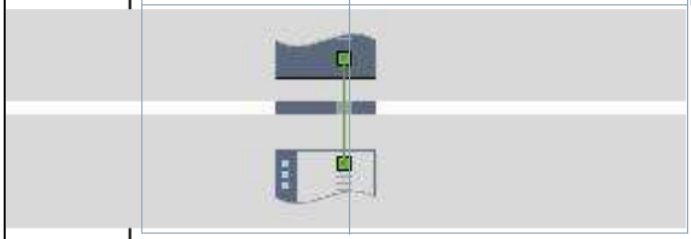
CIM Complete System with Simulation Inputs_V16 / Devices & networks

HMI 132 Pneumatic Station

HMI 132 Pneumatic Station	
General	
Name	HMI 132 Pneumatic Station

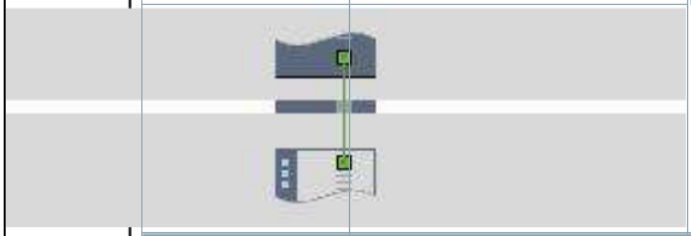
HMI_RT_1			
General			
Name	HMI 132 Pneumatic Station	**Device/application type**	KTP700 Basic PN
Author	billmac	**Comment**	
General\Catalog information			
Short designation	KTP700 Basic PN	**Description**	7" TFT display, 800 x 480 pixel, 64K colors; Key and Touch operation, 8 function keys; 1 x PROFINET, 1 x USB
Article number	6AV2 123-2GB03-0AX0	**Version**	13.0.1.0
Information			
Number of used PowerTags	0	**Memory requirements in runtime**	0
Compilation build number	0	**Date of last compilation**	
Date of last download			

PROFINET Interface_1			
General			
Name	PROFINET Interface_1	**Author**	billmac
Comment			
Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.132
Subnet mask:	255.0.0.0	**Use router**	False
Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	hmi 132 pneumatic station	**Converted name:**	hmixa132xapneumaticxastationed57
Device number:	0		
Advanced options\Printing full menu\General			
Name	Port_1	**Author**	billmac
Comment			
Advanced options\Printing full menu\Port interconnection\Local port:			
Local port:	HMI 132 Pneumatic Station.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Advanced options\Printing full menu\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

Port_1			
General			
Name	Port_1	**Author**	billmac
Comment			
Port interconnection\Local port:			
Local port:	HMI 132 Pneumatic Station.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

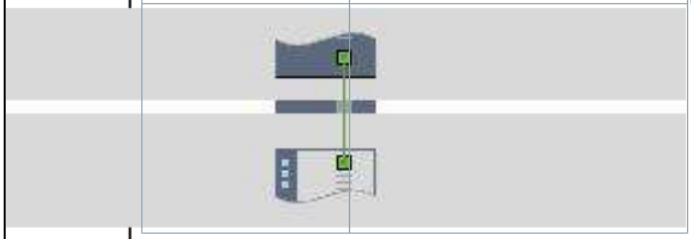
CIM Complete System with Simulation Inputs_V16 / Devices & networks

HMI 133 Process Station

HMI 133 Process Station	
General	
Name	HMI 133 Process Station

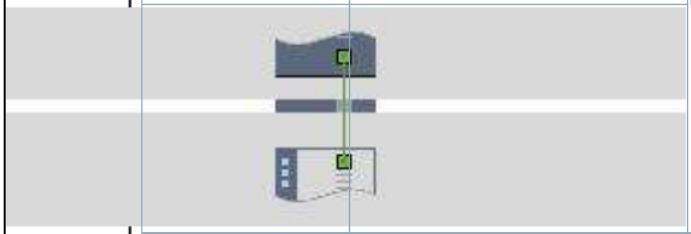
HMI_RT_3			
General			
Name	HMI 133 Process Station	**Device/application type**	KTP700 Basic PN
Author	RobertDa	**Comment**	
General\Catalog information			
Short designation	KTP700 Basic PN	**Description**	7" TFT display, 800 x 480 pixel, 64K colors; Key and Touch operation, 8 function keys; 1 x PROFINET, 1 x USB
Article number	6AV2 123-2GB03-0AX0	**Version**	15.1.0.0
Information			
Number of used PowerTags	66	**Memory requirements in runtime**	136168
Compilation build number	1	**Date of last compilation**	12/7/2020 8:21 PM
Date of last download			

PROFINET Interface_1			
General			
Name	PROFINET Interface_1	**Author**	RobertDa
Comment			
Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.133
Subnet mask:	255.0.0.0	**Use router**	False
Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	hmi 133 process station	**Converted name:**	hmixa133xaprocessxastationa93f
Device number:	0		
Advanced options\Printing full menu\General			
Name	Port_1	**Author**	RobertDa
Comment			
Advanced options\Printing full menu\Port interconnection\Local port:			
Local port:	HMI 133 Process Station.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Advanced options\Printing full menu\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

Port_1			
General			
Name	Port_1	**Author**	RobertDa
Comment			
Port interconnection\Local port:			
Local port:	HMI 133 Process Station.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

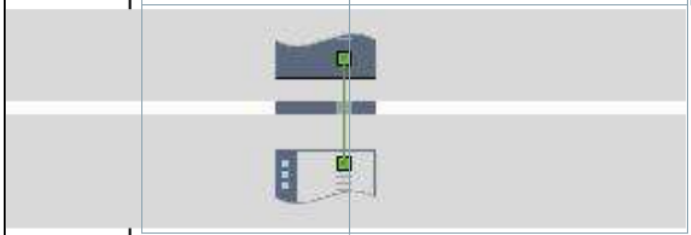
CIM Complete System with Simulation Inputs_V16 / Devices & networks

HMI 134 Hydraulic Station

HMI 134 Hydraulic Station	
General	
Name	HMI 134 Hydraulic Station

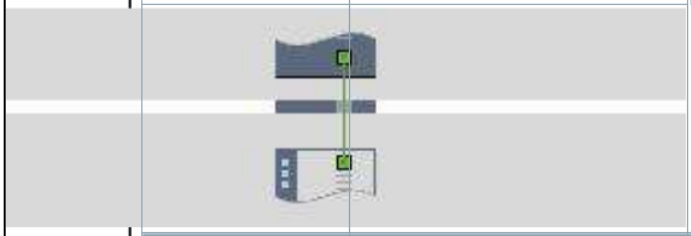
HMI_RT_4			
General			
Name	HMI 134 Hydraulic Station	**Device/application type**	KTP700 Basic PN
Author	RobertDa	**Comment**	
General\Catalog information			
Short designation	KTP700 Basic PN	**Description**	7" TFT display, 800 x 480 pixel, 64K colors; Key and Touch operation, 8 function keys; 1 x PROFINET, 1 x USB
Article number	6AV2 123-2GB03-0AX0	**Version**	13.0.1.0
Information			
Number of used PowerTags	0	**Memory requirements in runtime**	0
Compilation build number	0	**Date of last compilation**	
Date of last download			

PROFINET Interface_1			
General			
Name	PROFINET Interface_1	**Author**	RobertDa
Comment			
Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.134
Subnet mask:	255.0.0.0	**Use router**	False
Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	hmi 134 hydraulic station	**Converted name:**	hmixa134xahydraulicxastation7292
Device number:	0		
Advanced options\Printing full menu\General			
Name	Port_1	**Author**	RobertDa
Comment			
Advanced options\Printing full menu\Port interconnection\Local port:			
Local port:	HMI 134 Hydraulic Station.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Advanced options\Printing full menu\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

Port_1			
General			
Name	Port_1	**Author**	RobertDa
Comment			
Port interconnection\Local port:			
Local port:	HMI 134 Hydraulic Station.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

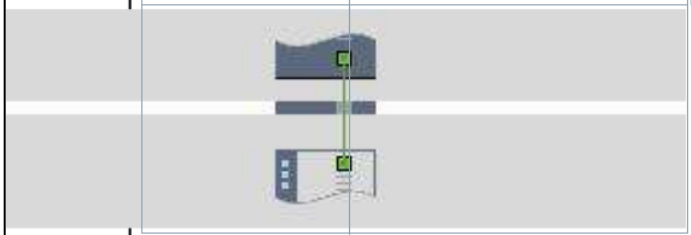
CIM Complete System with Simulation Inputs_V16 / Devices & networks

HMI 135 Water Recirculation System

HMI 135 Water Recirculation System	
General	
Name	HMI 135 Water Recirculation System

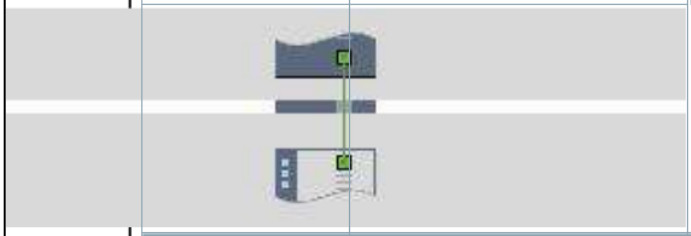
HMI_RT_5			
General			
Name	HMI 135 Water Recirculation System	**Device/application type**	KTP700 Basic PN
Author	RobertDa	**Comment**	
General\Catalog information			
Short designation	KTP700 Basic PN	**Description**	7" TFT display, 800 x 480 pixel, 64K colors; Key and Touch operation, 8 function keys; 1 x PROFINET, 1 x USB
Article number	6AV2 123-2GB03-0AX0	**Version**	14.0.0.0
Information			
Number of used PowerTags	0	**Memory requirements in runtime**	0
Compilation build number	0	**Date of last compilation**	
Date of last download			

PROFINET Interface_1			
General			
Name	PROFINET Interface_1	**Author**	RobertDa
Comment			
Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.135
Subnet mask:	255.0.0.0	**Use router**	False
Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	hmi 135 water recirculation system	**Converted name:**	hmixa135xawaterxarecirculationxasystemb8cd
Device number:	0		
Advanced options\Printing full menu\General			
Name	Port_1	**Author**	RobertDa
Comment			
Advanced options\Printing full menu\Port interconnection\Local port:			
Local port:	HMI 135 Water Recirculation System.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Advanced options\Printing full menu\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

Port_1			
General			
Name	Port_1	**Author**	RobertDa
Comment			
Port interconnection\Local port:			
Local port:	HMI 135 Water Recirculation System.IE_CP_1\PROFINET Interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner

CIM Complete System with Simulation Inputs_V16 / Devices & networks

S7-1200 station_1

PLC 101 Master - 0			
General\Project information			
Name	PLC 101 Master - 0	**Author**	billmac
Comment		**Slot**	1
Rack	0		
General\Catalog information			
Short designation	CPU 1214C DC/DC/DC	**Description**	Work memory 100 KB; 24VDC power supply with DI14 x 24VDC SINK/ SOURCE, DQ10 x 24VDC and AI2 on board; 6 high-speed counters and 4 pulse outputs on board; signal board expands on-board I/O; up to 3 communication modules for serial communication; up to 8 signal modules for I/O expansion; PROFINET interface for programming, HMI and PLC to PLC communication
Article number	6ES7 214-1AG40-0XB0	**Firmware version**	V4.1
General\Identification & Maintenance			
Plant designation		**Location identifier**	
Installation date	2015-06-24 17:27:37.187	**Additional information**	
PROFINET interface [X1]\General			
Name	PROFINET interface_1	**Author**	billmac
Comment			
PROFINET interface [X1]\General\Project information			
Name	DI 14/DQ 10_1	**Comment**	
Name	AI 2_1	**Comment**	
PROFINET interface [X1]\Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
PROFINET interface [X1]\Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.101
Subnet mask:	255.0.0.0	**Use router**	False
PROFINET interface [X1]\Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	plc 101 master - 0	**Converted name:**	plcxa101xamasterxa-xa08502
Device number:	0		
PROFINET interface [X1]\Time synchronization			
Enable time synchronization via NTP server	Enable time synchronization via NTP server		IP addresses
Server 1	0.0.0.0	**Server 2**	0.0.0.0
Server 3	0.0.0.0	**Server 4**	0.0.0.0
Update interval	10sec		
PROFINET interface [X1]\Digital inputs\Channel0			
Channel address	I0.0	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49152
Event name:	0	**Hardware interrupt:**	0
Rising edge0	Rising edge0		

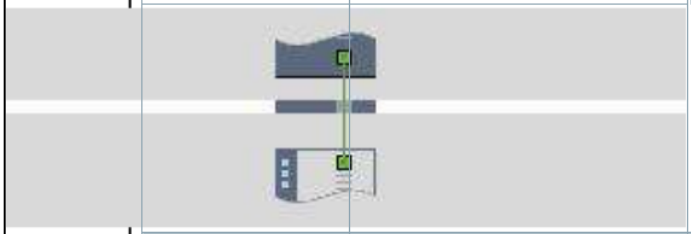
PROFINET interface [X1]\Digital inputs\Channel0			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49280
Event name:	0	**Hardware interrupt:**	0
Falling edge0	Falling edge0		
PROFINET interface [X1]\Digital inputs\Channel1			
Channel address	I0.1	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49153
Event name:	0	**Hardware interrupt:**	0
Rising edge1	Rising edge1		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49281
Event name:	0	**Hardware interrupt:**	0
Falling edge1	Falling edge1		
PROFINET interface [X1]\Digital inputs\Channel2			
Channel address	I0.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49154
Event name:	0	**Hardware interrupt:**	0
Rising edge2	Rising edge2		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49282
Event name:	0	**Hardware interrupt:**	0
Falling edge2	Falling edge2		
PROFINET interface [X1]\Digital inputs\Channel3			
Channel address	I0.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49155
Event name:	0	**Hardware interrupt:**	0
Rising edge3	Rising edge3		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49283
Event name:	0	**Hardware interrupt:**	0
Falling edge3	Falling edge3		
PROFINET interface [X1]\Digital inputs\Channel4			
Channel address	I0.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49156
Event name:	0	**Hardware interrupt:**	0
Rising edge4	Rising edge4		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49284
Event name:	0	**Hardware interrupt:**	0
Falling edge4	Falling edge4		
PROFINET interface [X1]\Digital inputs\Channel5			
Channel address	I0.5	**Input filters**	6.4 millisec

Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49157
Event name:	0	**Hardware interrupt:**	0
Rising edge5	Rising edge5		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49285
Event name:	0	**Hardware interrupt:**	0
Falling edge5	Falling edge5		
PROFINET interface [X1]\Digital inputs\Channel6			
Channel address	I0.6	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49158
Event name:	0	**Hardware interrupt:**	0
Rising edge6	Rising edge6		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49286
Event name:	0	**Hardware interrupt:**	0
Falling edge6	Falling edge6		
PROFINET interface [X1]\Digital inputs\Channel7			
Channel address	I0.7	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49159
Event name:	0	**Hardware interrupt:**	0
Rising edge7	Rising edge7		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49287
Event name:	0	**Hardware interrupt:**	0
Falling edge7	Falling edge7		
PROFINET interface [X1]\Digital inputs\Channel8			
Channel address	I1.0	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel8			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49160
Event name:	0	**Hardware interrupt:**	0
Rising edge8	Rising edge8		
PROFINET interface [X1]\Digital inputs\Channel8			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49288
Event name:	0	**Hardware interrupt:**	0
Falling edge8	Falling edge8		
PROFINET interface [X1]\Digital inputs\Channel9			
Channel address	I1.1	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel9			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49161
Event name:	0	**Hardware interrupt:**	0
Rising edge9	Rising edge9		

PROFINET interface [X1]\Digital inputs\Channel9			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49289
Event name:	0	**Hardware interrupt:**	0
Falling edge9	Falling edge9		
PROFINET interface [X1]\Digital inputs\Channel10			
Channel address	I1.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel10			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49162
Event name:	0	**Hardware interrupt:**	0
Rising edge10	Rising edge10		
PROFINET interface [X1]\Digital inputs\Channel10			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49290
Event name:	0	**Hardware interrupt:**	0
Falling edge10	Falling edge10		
PROFINET interface [X1]\Digital inputs\Channel11			
Channel address	I1.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel11			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49163
Event name:	0	**Hardware interrupt:**	0
Rising edge11	Rising edge11		
PROFINET interface [X1]\Digital inputs\Channel11			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49291
Event name:	0	**Hardware interrupt:**	0
Falling edge11	Falling edge11		
PROFINET interface [X1]\Digital inputs\Channel12			
Channel address	I1.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel13			
Channel address	I1.5	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Analog inputs\Noise reduction			
Integration time	50 Hz (20 ms)		
PROFINET interface [X1]\Analog inputs\Channel0			
Channel address	IW64	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1
PROFINET interface [X1]\Analog inputs\Channel1			
Channel address	IW66	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1
PROFINET interface [X1]\Digital outputs			
Reaction to CPU STOP	Use substitute value		
PROFINET interface [X1]\Digital outputs\Channel0			
Channel address	Q0.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel1			
Channel address	Q0.1	**Substitute a value of 1 on a change from RUN to STOP.**	0

PROFINET interface [X1]\Digital outputs\Channel2			
Channel address	Q0.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel3			
Channel address	Q0.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel4			
Channel address	Q0.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel5			
Channel address	Q0.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel6			
Channel address	Q0.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel7			
Channel address	Q0.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel8			
Channel address	Q1.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel9			
Channel address	Q1.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Operating mode			
IO controller	True	**IO system**	
Device number	0	**IO device**	False
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	0.0	**End address**	1.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	64	**End address**	67
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Output addresses			
Start address	0.0	**End address**	1.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\Advanced options\Interface options			
Support device replacement without exchangeable medium	True	**Permit overwriting of device names of all assigned IO devices**	False
Use IEC V2.2 LLDP mode	False	**Keep-Alive connection monitoring:**	30s
PROFINET interface [X1]\Advanced options\Real time settings\IO communication			
Send clock:	1.000ms		
PROFINET interface [X1]\Advanced options\Real time settings\Real time options			
Calculated bandwidth for cyclic IO data:	0.000ms	**Calculated bandwidth for cyclic IO data:**	0.000%
PROFINET interface [X1]\Advanced options\Port [X1 P1]\General			
Name	Port_1	**Author**	billmac
Comment			

PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Local port:			
Local port:	PLC 101 Master - 0\PROFINET interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Activate			
Activate this port for use	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Connection			
Transmission rate / duplex:	Automatic	**Monitor**	False
Enable autonegotiation	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Boundaries			
End of detection of accessible devices	False	**End of topology discovery**	False
End of the sync domain	False		
PROFINET interface [X1]\Web server access			
Enable Web server for the IP address of this interface	True	**The Web server must also be activated in the properties of the PLC.**	
High speed counters (HSC)\HSC1\General\Enable			
Enable this high speed counter	0	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0
High speed counters (HSC)\HSC1\General\Project information			
Name	HSC_1	**Comment**	
Name	HSC_2	**Comment**	
Name	HSC_3	**Comment**	
Name	HSC_4	**Comment**	
Name	HSC_5	**Comment**	
Name	HSC_6	**Comment**	
High speed counters (HSC)\HSC1\I/O addresses\Input addresses			
Start address	1000.0	**End address**	1003.7
Start address	1004.0	**End address**	1007.7
Organization block	0	**Start address**	1008.0
End address	1011.7	**Organization block**	0
Process image	0	**Start address**	1012.0
End address	1015.7	**Organization block**	0
Process image	0	**Start address**	1016.0
End address	1019.7	**Organization block**	0
Process image	0	**Start address**	1020.0
End address	1023.7	**Organization block**	0
Process image	0	**Organization block**	0

Process image	0	**Process image**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Enable			
Enable this pulse generator	0	**Enable this pulse generator**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Project information			
Name	Pulse_1	**Comment**	
Name	Pulse_2	**Comment**	
Pulse generators (PTO/PWM)\PTO1/PWM1\I/O addresses\Output addresses			
Start address	1000.0	**End address**	1001.7
Start address	1002.0	**End address**	1003.7
Organization block	0	**Organization block**	0
Process image	0	**Process image**	0
Startup			
Startup after POWER ON	Warm restart - mode before POWER OFF	**Comparison preset to actual configuration**	Startup CPU even if mismatch
Configuration time	60000ms	**OBs should be interruptible**	1
Cycle			
Cycle monitoring time	150ms		
Enable minimum cycle time for cyclic OBs	0	**Minimum cycle time**	1ms
Communication load			
Cycle load due to communication	20%		
System and clock memory\System memory bits			
Enable the use of system memory byte	1	**Address of system memory byte (MBx)**	499
First cycle	%M499.0 (FirstScan)	**Diagnostic status changed**	%M499.1 (DiagStatusUpdate)
Always 1 (high)	%M499.2 (AlwaysTRUE)	**Always 0 (low)**	%M499.3 (AlwaysFALSE)
System and clock memory\Clock memory bits			
Enable the use of clock memory byte	1	**Address of clock memory byte (MBx)**	500
10 Hz clock	%M500.0 (Clock_10Hz)	**5 Hz clock**	%M500.1 (Clock_5Hz)
2.5 Hz clock	%M500.2 (Clock_2.5Hz)	**2 Hz clock**	%M500.3 (Clock_2Hz)
1.25 Hz clock	%M500.4 (Clock_1.25Hz)	**1 Hz clock**	%M500.5 (Clock_1Hz)
0.625 Hz clock	%M500.6 (Clock_0.625Hz)	**0.5 Hz clock**	%M500.7 (Clock_0.5Hz)
Web server\General			
Activate Web server on all modules of this device	True	**Permit access only with HTTPS**	False
Web server\Automatic update			
Enable automatic update	True	**Update interval**	10s
Web server\User interface languages			

Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)
Web server\User management	
User name	**User rights**
Everybody	Query diagnostics ,Read tags ,Write tags ,Read tag status ,Write tag status ,Open user-defined pages ,Write in user-defined web pages ,Read files ,Write/delete files ,Change operating mode ,Let LED flash ,Perform firmware update

Web server\User-defined web pages					
Application name	**HTML source path**	**Default HTML page**	**Files with dynamic content**	**Web DB number**	**Fragment DB number**
	H:\Automation\Web-server Pages	PLC_101.html	.htm;.html	333	334

Web server\Overview of interfaces		
Device	**Interface**	**Enabled web server access**
PLC 101 Master - 0	PROFINET interface_1	True

User interface languages	
Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Time of day\Local time	
Time zone	(UTC +01:00) Berlin, Bern, Brussels, Rome, Stockholm, Vienna

Time of day\Daylight saving time			
Activate daylight saving time	1	**Difference between standard and daylight saving time**	60mins

Time of day\Daylight saving time\Start of daylight saving time			
Starting week of the month:	Last		Sunday
of	March	**at**	01:00 a.m.

Time of day\Daylight saving time\Start of standard time			
	Last		Sunday
of	October	**at**	02:00 a.m.

Protection & Security	
Level of protection	No protection

Protection & Security\Connection mechanisms	
Permit access with PUT/GET communication from remote partner	True

Configuration control\Configuration control for central configuration	
Allow to reconfigure the device via the user program	0

Connection resources\				
	Station resources - Reserved - Maximum	**Station resources - Reserved - Configured**	**Station resources - Dynamic - Configured**	**Module resources - PLC 101 Master - 0 [CPU 1214C DC/DC/DC] - Configured**
Maximum number of resources:		62	6	68
	Maximum	Configured	Configured	Configured
PG communication:	4	-	-	-
HMI communication:	12	1	0	1
S7 communication:	8	1	0	1
Open user communication:	8	0	0	0
Web communication:	30	-	-	-
Other communication:	-	-	0	0
Total resources used:		2	0	2
Available resources:		60	6	66

Overview of addresses\Overview of addresses\Overview of addresses			
Inputs	True	**Outputs**	True
Address gaps	False	**Slot**	True

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
I	0	1	DI 14/DQ 10_1	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 1
O	0	1	DI 14/DQ 10_1	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 1
I	64	67	AI 2_1	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 2
I	1000	1003	HSC_1	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 16
I	1004	1007	HSC_2	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 17
I	1008	1011	HSC_3	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 18
I	1012	1015	HSC_4	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 19
I	1016	1019	HSC_5	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 20
I	1020	1023	HSC_6	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 21
I	8	9	DI 16x24VDC_1	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	2
I	16	17	DI 16x24VDC_2	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	4
O	1000	1001	Pulse_1	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 32
O	1002	1003	Pulse_2	Automatic update	PLC 101 Master - 0	-	2 Bytes	-	0	1 33

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
					[CPU 1214C DC/DC/DC]					
O	1004	1005	Pulse_3	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 34
O	1006	1007	Pulse_4	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 35
O	12	13	DQ 16xRe-lay_1	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	3
O	20	21	DQ 16xRe-lay_2	Automatic update	PLC 101 Master - 0 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	5

DI 16x24VDC_1			
General\Project information			
Name	DI 16x24VDC_1	**Author**	billmac
Comment		**Slot**	2
General\Catalog information			
Short designation	SM 1221 DI16 x 24VDC	**Description**	Digital input module DI16 x 24VDC SINK/SOURCE; configurable input de-lay; plug-in terminal blocks
Article number	6ES7 221-1BH32-0XB0	**Firmware version**	V2.0
DI 16\Project information			
Name	DI 16x24VDC_1	**Comment**	
DI 16\Digital inputs\Input filters			
I8.0 - I8.3	6.40ms	**I8.4 - I8.7**	6.40ms
I9.0 - I9.3	6.40ms	**I9.4 - I9.7**	6.40ms
DI 16\Digital inputs\Channel0			
Channel address	I8.0		
DI 16\Digital inputs\Channel1			
Channel address	I8.1		
DI 16\Digital inputs\Channel2			
Channel address	I8.2		
DI 16\Digital inputs\Channel3			
Channel address	I8.3		
DI 16\Digital inputs\Channel4			
Channel address	I8.4		
DI 16\Digital inputs\Channel5			
Channel address	I8.5		
DI 16\Digital inputs\Channel6			
Channel address	I8.6		
DI 16\Digital inputs\Channel7			
Channel address	I8.7		
DI 16\Digital inputs\Channel8			
Channel address	I9.0		
DI 16\Digital inputs\Channel9			
Channel address	I9.1		

DI 16\Digital inputs\Channel10			
Channel address	I9.2		
DI 16\Digital inputs\Channel11			
Channel address	I9.3		
DI 16\Digital inputs\Channel12			
Channel address	I9.4		
DI 16\Digital inputs\Channel13			
Channel address	I9.5		
DI 16\Digital inputs\Channel14			
Channel address	I9.6		
DI 16\Digital inputs\Channel15			
Channel address	I9.7		
DI 16\I/O addresses\Input addresses			
Start address	8.0	**End address**	9.7
Organization block	0	**Process image**	0

DQ 16xRelay_1			
General\Project information			
Name	DQ 16xRelay_1	**Author**	BillM
Comment		**Slot**	3
General\Catalog information			
Short designation	SM 1222 DQ16 x relay	**Description**	Digital output module DQ16 x relay; plug-in terminal blocks
Article number	6ES7 222-1HH32-0XB0	**Firmware version**	V2.0
DQ 16\Project information			
Name	DQ 16xRelay_1	**Comment**	
DQ 16\Digital outputs			
Reaction to CPU STOP	Use substitute value		
DQ 16\Digital outputs\Channel0			
Channel address	Q12.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel1			
Channel address	Q12.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel2			
Channel address	Q12.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel3			
Channel address	Q12.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel4			
Channel address	Q12.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel5			
Channel address	Q12.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel6			
Channel address	Q12.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel7			
Channel address	Q12.7	**Substitute a value of 1 on a change from RUN to STOP.**	0

DQ 16\Digital outputs\Channel8			
Channel address	Q13.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel9			
Channel address	Q13.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel10			
Channel address	Q13.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel11			
Channel address	Q13.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel12			
Channel address	Q13.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel13			
Channel address	Q13.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel14			
Channel address	Q13.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel15			
Channel address	Q13.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\I/O addresses\Output addresses			
Start address	12.0	**End address**	13.7
Organization block	0	**Process image**	0

DI 16x24VDC_2			
General\Project information			
Name	DI 16x24VDC_2	**Author**	Bill
Comment		**Slot**	4
General\Catalog information			
Short designation	SM 1221 DI16 x 24VDC	**Description**	Digital input module DI16 x 24VDC SINK/SOURCE; configurable input delay; plug-in terminal blocks
Article number	6ES7 221-1BH32-0XB0	**Firmware version**	V2.0
DI 16\Project information			
Name	DI 16x24VDC_2	**Comment**	
DI 16\Digital inputs\Input filters			
I16.0 - I16.3	6.40ms	**I16.4 - I16.7**	6.40ms
I17.0 - I17.3	6.40ms	**I17.4 - I17.7**	6.40ms
DI 16\Digital inputs\Channel0			
Channel address	I16.0		
DI 16\Digital inputs\Channel1			
Channel address	I16.1		
DI 16\Digital inputs\Channel2			
Channel address	I16.2		
DI 16\Digital inputs\Channel3			
Channel address	I16.3		
DI 16\Digital inputs\Channel4			
Channel address	I16.4		

DI 16\Digital inputs\Channel5			
Channel address	I16.5		
DI 16\Digital inputs\Channel6			
Channel address	I16.6		
DI 16\Digital inputs\Channel7			
Channel address	I16.7		
DI 16\Digital inputs\Channel8			
Channel address	I17.0		
DI 16\Digital inputs\Channel9			
Channel address	I17.1		
DI 16\Digital inputs\Channel10			
Channel address	I17.2		
DI 16\Digital inputs\Channel11			
Channel address	I17.3		
DI 16\Digital inputs\Channel12			
Channel address	I17.4		
DI 16\Digital inputs\Channel13			
Channel address	I17.5		
DI 16\Digital inputs\Channel14			
Channel address	I17.6		
DI 16\Digital inputs\Channel15			
Channel address	I17.7		
DI 16\I/O addresses\Input addresses			
Start address	16.0	**End address**	17.7
Organization block	0	**Process image**	0

DQ 16xRelay_2			
General\Project information			
Name	DQ 16xRelay_2	**Author**	Bill
Comment		**Slot**	5
General\Catalog information			
Short designation	SM 1222 DQ16 x relay	**Description**	Digital output module DQ16 x relay; plug-in terminal blocks
Article number	6ES7 222-1HH32-0XB0	**Firmware version**	V2.0
DQ 16\Project information			
Name	DQ 16xRelay_2	**Comment**	
DQ 16\Digital outputs			
Reaction to CPU STOP	Use substitute value		
DQ 16\Digital outputs\Channel0			
Channel address	Q20.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel1			
Channel address	Q20.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel2			
Channel address	Q20.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel3			
Channel address	Q20.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel4			
Channel address	Q20.4	**Substitute a value of 1 on a change from RUN to STOP.**	0

DQ 16\Digital outputs\Channel5			
Channel address	Q20.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel6			
Channel address	Q20.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel7			
Channel address	Q20.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel8			
Channel address	Q21.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel9			
Channel address	Q21.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel10			
Channel address	Q21.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel11			
Channel address	Q21.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel12			
Channel address	Q21.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel13			
Channel address	Q21.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel14			
Channel address	Q21.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel15			
Channel address	Q21.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\I/O addresses\Output addresses			
Start address	20.0	**End address**	21.7
Organization block	0	**Process image**	0

CIM Complete System with Simulation Inputs_V16 / Devices & networks

S7-1200 station_2

PLC 102 Pneumatic Station - 2			
General\Project information			
Name	PLC 102 Pneumatic Station - 2	**Author**	billmac
Comment		**Slot**	1
Rack	0		
General\Catalog information			
Short designation	CPU 1214C DC/DC/DC	**Description**	Work memory 100 KB; 24VDC power supply with DI14 x 24VDC SINK/ SOURCE, DQ10 x 24VDC and AI2 on board; 6 high-speed counters and 4 pulse outputs on board; signal board expands on-board I/O; up to 3 communication modules for serial communication; up to 8 signal modules for I/O expansion; PROFINET interface for programming, HMI and PLC to PLC communication
Article number	6ES7 214-1AG40-0XB0	**Firmware version**	V4.1
General\Identification & Maintenance			
Plant designation		**Location identifier**	
Installation date	2018-11-20 19:31:51.238	**Additional information**	
PROFINET interface [X1]\General			
Name	PROFINET interface_1	**Author**	billmac
Comment			
PROFINET interface [X1]\General\Project information			
Name	DI 14/DQ 10_1	**Comment**	
Name	AI 2_1	**Comment**	
PROFINET interface [X1]\Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
PROFINET interface [X1]\Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.102
Subnet mask:	255.0.0.0	**Use router**	False
PROFINET interface [X1]\Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	plc 102 pneumatic station - 2	**Converted name:**	plcxa102xapneumaticxastationxa-xa2705c
Device number:	0		
PROFINET interface [X1]\Time synchronization			
Enable time synchronization via NTP server	Enable time synchronization via NTP server		IP addresses
Server 1	0.0.0.0	**Server 2**	0.0.0.0
Server 3	0.0.0.0	**Server 4**	0.0.0.0
Update interval	10sec		
PROFINET interface [X1]\Digital inputs\Channel0			
Channel address	I0.0	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49152
Event name:	0	**Hardware interrupt:**	0
Rising edge0	Rising edge0		

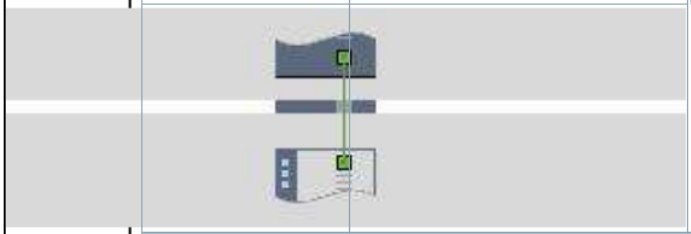
PROFINET interface [X1]\Digital inputs\Channel0			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49280
Event name:	0	**Hardware interrupt:**	0
Falling edge0	Falling edge0		
PROFINET interface [X1]\Digital inputs\Channel1			
Channel address	I0.1	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49153
Event name:	0	**Hardware interrupt:**	0
Rising edge1	Rising edge1		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49281
Event name:	0	**Hardware interrupt:**	0
Falling edge1	Falling edge1		
PROFINET interface [X1]\Digital inputs\Channel2			
Channel address	I0.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49154
Event name:	0	**Hardware interrupt:**	0
Rising edge2	Rising edge2		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49282
Event name:	0	**Hardware interrupt:**	0
Falling edge2	Falling edge2		
PROFINET interface [X1]\Digital inputs\Channel3			
Channel address	I0.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49155
Event name:	0	**Hardware interrupt:**	0
Rising edge3	Rising edge3		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49283
Event name:	0	**Hardware interrupt:**	0
Falling edge3	Falling edge3		
PROFINET interface [X1]\Digital inputs\Channel4			
Channel address	I0.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49156
Event name:	0	**Hardware interrupt:**	0
Rising edge4	Rising edge4		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49284
Event name:	0	**Hardware interrupt:**	0
Falling edge4	Falling edge4		
PROFINET interface [X1]\Digital inputs\Channel5			
Channel address	I0.5	**Input filters**	6.4 millisec

Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49157
Event name:	0	**Hardware interrupt:**	0
Rising edge5	Rising edge5		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49285
Event name:	0	**Hardware interrupt:**	0
Falling edge5	Falling edge5		
PROFINET interface [X1]\Digital inputs\Channel6			
Channel address	I0.6	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49158
Event name:	0	**Hardware interrupt:**	0
Rising edge6	Rising edge6		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49286
Event name:	0	**Hardware interrupt:**	0
Falling edge6	Falling edge6		
PROFINET interface [X1]\Digital inputs\Channel7			
Channel address	I0.7	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49159
Event name:	0	**Hardware interrupt:**	0
Rising edge7	Rising edge7		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49287
Event name:	0	**Hardware interrupt:**	0
Falling edge7	Falling edge7		
PROFINET interface [X1]\Digital inputs\Channel8			
Channel address	I1.0	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel8			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49160
Event name:	0	**Hardware interrupt:**	0
Rising edge8	Rising edge8		
PROFINET interface [X1]\Digital inputs\Channel8			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49288
Event name:	0	**Hardware interrupt:**	0
Falling edge8	Falling edge8		
PROFINET interface [X1]\Digital inputs\Channel9			
Channel address	I1.1	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel9			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49161
Event name:	0	**Hardware interrupt:**	0
Rising edge9	Rising edge9		

PROFINET interface [X1]\Digital inputs\Channel9			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49289
Event name:	0	**Hardware interrupt:**	0
Falling edge9	Falling edge9		
PROFINET interface [X1]\Digital inputs\Channel10			
Channel address	I1.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel10			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49162
Event name:	0	**Hardware interrupt:**	0
Rising edge10	Rising edge10		
PROFINET interface [X1]\Digital inputs\Channel10			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49290
Event name:	0	**Hardware interrupt:**	0
Falling edge10	Falling edge10		
PROFINET interface [X1]\Digital inputs\Channel11			
Channel address	I1.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel11			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49163
Event name:	0	**Hardware interrupt:**	0
Rising edge11	Rising edge11		
PROFINET interface [X1]\Digital inputs\Channel11			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49291
Event name:	0	**Hardware interrupt:**	0
Falling edge11	Falling edge11		
PROFINET interface [X1]\Digital inputs\Channel12			
Channel address	I1.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel13			
Channel address	I1.5	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Analog inputs\Noise reduction			
Integration time	50 Hz (20 ms)		
PROFINET interface [X1]\Analog inputs\Channel0			
Channel address	IW64	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1
PROFINET interface [X1]\Analog inputs\Channel1			
Channel address	IW66	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1
PROFINET interface [X1]\Digital outputs			
Reaction to CPU STOP	Use substitute value		
PROFINET interface [X1]\Digital outputs\Channel0			
Channel address	Q0.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel1			
Channel address	Q0.1	**Substitute a value of 1 on a change from RUN to STOP.**	0

PROFINET interface [X1]\Digital outputs\Channel2			
Channel address	Q0.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel3			
Channel address	Q0.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel4			
Channel address	Q0.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel5			
Channel address	Q0.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel6			
Channel address	Q0.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel7			
Channel address	Q0.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel8			
Channel address	Q1.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel9			
Channel address	Q1.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Operating mode			
IO controller	True	**IO system**	
Device number	0	**IO device**	False
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	0.0	**End address**	1.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	64	**End address**	67
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Output addresses			
Start address	0.0	**End address**	1.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\Advanced options\Interface options			
Support device replacement without exchangeable medium	True	**Permit overwriting of device names of all assigned IO devices**	False
Use IEC V2.2 LLDP mode	False	**Keep-Alive connection monitoring:**	30s
PROFINET interface [X1]\Advanced options\Real time settings\IO communication			
Send clock:	1.000ms		
PROFINET interface [X1]\Advanced options\Real time settings\Real time options			
Calculated bandwidth for cyclic IO data:	0.000ms	**Calculated bandwidth for cyclic IO data:**	0.000%
PROFINET interface [X1]\Advanced options\Port [X1 P1]\General			
Name	Port_1	**Author**	billmac
Comment			

PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Local port:			
Local port:	PLC 102 Pneumatic Station - 2\PROFINET interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Activate			
Activate this port for use	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Connection			
Transmission rate / duplex:	Automatic	**Monitor**	False
Enable autonegotiation	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Boundaries			
End of detection of accessible devices	False	**End of topology discovery**	False
End of the sync domain	False		
PROFINET interface [X1]\Web server access			
Enable Web server for the IP address of this interface	True	**The Web server must also be activated in the properties of the PLC.**	
High speed counters (HSC)\HSC1\General\Enable			
Enable this high speed counter	0	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0
High speed counters (HSC)\HSC1\General\Project information			
Name	HSC_1	**Comment**	
Name	HSC_2	**Comment**	
Name	HSC_3	**Comment**	
Name	HSC_4	**Comment**	
Name	HSC_5	**Comment**	
Name	HSC_6	**Comment**	
High speed counters (HSC)\HSC1\I/O addresses\Input addresses			
Start address	1000.0	**End address**	1003.7
Start address	1004.0	**End address**	1007.7
Organization block	0	**Start address**	1008.0
End address	1011.7	**Organization block**	0
Process image	0	**Start address**	1012.0
End address	1015.7	**Organization block**	0
Process image	0	**Start address**	1016.0
End address	1019.7	**Organization block**	0
Process image	0	**Start address**	1020.0
End address	1023.7	**Organization block**	0
Process image	0	**Organization block**	0

Process image	0	**Process image**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Enable			
Enable this pulse generator	0	**Enable this pulse generator**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Project information			
Name	Pulse_1	**Comment**	
Name	Pulse_2	**Comment**	
Pulse generators (PTO/PWM)\PTO1/PWM1\I/O addresses\Output addresses			
Start address	1000.0	**End address**	1001.7
Start address	1002.0	**End address**	1003.7
Organization block	0	**Organization block**	0
Process image	0	**Process image**	0
Startup			
Startup after POWER ON	Warm restart - mode before POWER OFF	**Comparison preset to actual configuration**	Startup CPU even if mismatch
Configuration time	60000ms	**OBs should be interruptible**	1
Cycle			
Cycle monitoring time	150ms		
Enable minimum cycle time for cyclic OBs	0	**Minimum cycle time**	1ms
Communication load			
Cycle load due to communication	20%		
System and clock memory\System memory bits			
Enable the use of system memory byte	1	**Address of system memory byte (MBx)**	499
First cycle	%M499.0 (FirstScan)	**Diagnostic status changed**	%M499.1 (DiagStatusUpdate)
Always 1 (high)	%M499.2 (AlwaysTRUE)	**Always 0 (low)**	%M499.3 (AlwaysFALSE)
System and clock memory\Clock memory bits			
Enable the use of clock memory byte	1	**Address of clock memory byte (MBx)**	500
10 Hz clock	%M500.0 (Clock_10Hz)	**5 Hz clock**	%M500.1 (Clock_5Hz)
2.5 Hz clock	%M500.2 (Clock_2.5Hz)	**2 Hz clock**	%M500.3 (Clock_2Hz)
1.25 Hz clock	%M500.4 (Clock_1.25Hz)	**1 Hz clock**	%M500.5 (Clock_1Hz)
0.625 Hz clock	%M500.6 (Clock_0.625Hz)	**0.5 Hz clock**	%M500.7 (Clock_0.5Hz)
Web server\General			
Activate Web server on all modules of this device	True	**Permit access only with HTTPS**	False
Web server\Automatic update			
Enable automatic update	True	**Update interval**	10s
Web server\User interface languages			

Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)
Web server\User management	
User name	**User rights**
Everybody	Query diagnostics ,Read tags ,Write tags ,Read tag status ,Write tag status ,Open user-defined pages ,Write in user-defined web pages ,Read files ,Write/delete files ,Change operating mode ,Let LED flash ,Perform firmware update

Web server\User-defined web pages					
Application name	**HTML source path**	**Default HTML page**	**Files with dynamic content**	**Web DB number**	**Fragment DB number**
	H:\Automation\Web-server Pages	PLC_102.html	.htm;.html	333	334

Web server\Overview of interfaces		
Device	**Interface**	**Enabled web server access**
PLC 102 Pneumatic Station - 2	PROFINET interface_1	True

User interface languages	
Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Time of day\Local time	
Time zone	(UTC +01:00) Berlin, Bern, Brussels, Rome, Stockholm, Vienna

Time of day\Daylight saving time			
Activate daylight saving time	1	**Difference between standard and daylight saving time**	60mins

Time of day\Daylight saving time\Start of daylight saving time			
Starting week of the month:	Last		Sunday
of	March	**at**	01:00 a.m.

Time of day\Daylight saving time\Start of standard time			
	Last		Sunday
of	October	**at**	02:00 a.m.

Protection & Security	
Level of protection	No protection

Protection & Security\Connection mechanisms	
Permit access with PUT/GET communication from remote partner	True

Configuration control\Configuration control for central configuration	
Allow to reconfigure the device via the user program	0

Connection resources\				
	Station resources - Reserved - Maximum	**Station resources - Reserved - Configured**	**Station resources - Dynamic - Configured**	**Module resources - PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC] - Configured**
Maximum number of resources:		62	6	68
	Maximum	Configured	Configured	Configured
PG communication:	4	-	-	-
HMI communication:	12	2	0	2
S7 communication:	8	1	0	1
Open user communication:	8	0	0	0
Web communication:	30	-	-	-
Other communication:	-	-	0	0
Total resources used:		3	0	3
Available resources:		59	6	65

Overview of addresses\Overview of addresses\Overview of addresses			
Inputs	True	**Outputs**	True
Address gaps	False	**Slot**	True

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
I	0	1	DI 14/DQ 10_1	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 1
O	0	1	DI 14/DQ 10_1	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 1
I	1004	1007	HSC_2	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 17
I	1008	1011	HSC_3	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 18
O	12	13	DQ 16xRe-lay_1	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	3
I	64	67	AI 2_1	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 2
I	1020	1023	HSC_6	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 21
O	1004	1005	Pulse_3	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 34
O	1000	1001	Pulse_1	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 32
I	1012	1015	HSC_4	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 19
I	1000	1003	HSC_1	Automatic update	PLC 102 Pneumatic	-	4 Bytes	-	0	1 16

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
					Station - 2 [CPU 1214C DC/DC/DC]					
O	1006	1007	Pulse_4	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 35
O	1002	1003	Pulse_2	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 33
I	8	9	DI 16x24VDC_1	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	2
I	1016	1019	HSC_5	Automatic update	PLC 102 Pneumatic Station - 2 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 20

DI 16x24VDC_1			
General\Project information			
Name	DI 16x24VDC_1	**Author**	BillM
Comment		**Slot**	2
General\Catalog information			
Short designation	SM 1221 DI16 x 24VDC	**Description**	Digital input module DI16 x 24VDC SINK/SOURCE; configurable input de-lay; plug-in terminal blocks
Article number	6ES7 221-1BH32-0XB0	**Firmware version**	V2.0
DI 16\Project information			
Name	DI 16x24VDC_1	**Comment**	
DI 16\Digital inputs\Input filters			
I8.0 - I8.3	6.40ms	**I8.4 - I8.7**	6.40ms
I9.0 - I9.3	6.40ms	**I9.4 - I9.7**	6.40ms
DI 16\Digital inputs\Channel0			
Channel address	I8.0		
DI 16\Digital inputs\Channel1			
Channel address	I8.1		
DI 16\Digital inputs\Channel2			
Channel address	I8.2		
DI 16\Digital inputs\Channel3			
Channel address	I8.3		
DI 16\Digital inputs\Channel4			
Channel address	I8.4		
DI 16\Digital inputs\Channel5			
Channel address	I8.5		
DI 16\Digital inputs\Channel6			
Channel address	I8.6		
DI 16\Digital inputs\Channel7			
Channel address	I8.7		

DI 16\Digital inputs\Channel8			
Channel address	I9.0		
DI 16\Digital inputs\Channel9			
Channel address	I9.1		
DI 16\Digital inputs\Channel10			
Channel address	I9.2		
DI 16\Digital inputs\Channel11			
Channel address	I9.3		
DI 16\Digital inputs\Channel12			
Channel address	I9.4		
DI 16\Digital inputs\Channel13			
Channel address	I9.5		
DI 16\Digital inputs\Channel14			
Channel address	I9.6		
DI 16\Digital inputs\Channel15			
Channel address	I9.7		
DI 16\I/O addresses\Input addresses			
Start address	8.0	**End address**	9.7
Organization block	0	**Process image**	0

DQ 16xRelay_1			
General\Project information			
Name	DQ 16xRelay_1	**Author**	BillM
Comment		**Slot**	3
General\Catalog information			
Short designation	SM 1222 DQ16 x relay	**Description**	Digital output module DQ16 x relay; plug-in terminal blocks
Article number	6ES7 222-1HH32-0XB0	**Firmware version**	V2.0
DQ 16\Project information			
Name	DQ 16xRelay_1	**Comment**	
DQ 16\Digital outputs			
Reaction to CPU STOP	Use substitute value		
DQ 16\Digital outputs\Channel0			
Channel address	Q12.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel1			
Channel address	Q12.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel2			
Channel address	Q12.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel3			
Channel address	Q12.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel4			
Channel address	Q12.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel5			
Channel address	Q12.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel6			
Channel address	Q12.6	**Substitute a value of 1 on a change from RUN to STOP.**	0

DQ 16\Digital outputs\Channel7			
Channel address	Q12.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel8			
Channel address	Q13.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel9			
Channel address	Q13.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel10			
Channel address	Q13.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel11			
Channel address	Q13.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel12			
Channel address	Q13.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel13			
Channel address	Q13.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel14			
Channel address	Q13.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel15			
Channel address	Q13.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\I/O addresses\Output addresses			
Start address	12.0	**End address**	13.7
Organization block	0	**Process image**	0

CIM Complete System with Simulation Inputs_V16 / Devices & networks

S7-1200 station_3

PLC 103 Process Station - 4			
General\Project information			
Name	PLC 103 Process Station - 4	**Author**	RobertDa
Comment		**Slot**	1
Rack	0		
General\Catalog information			
Short designation	CPU 1214C DC/DC/DC	**Description**	Work memory 100 KB; 24VDC power supply with DI14 x 24VDC SINK/ SOURCE, DQ10 x 24VDC and AI2 on board; 6 high-speed counters and 4 pulse outputs on board; signal board expands on-board I/O; up to 3 communication modules for serial communication; up to 8 signal modules for I/O expansion; PROFINET interface for programming, HMI and PLC to PLC communication
Article number	6ES7 214-1AG40-0XB0	**Firmware version**	V4.1
General\Identification & Maintenance			
Plant designation		**Location identifier**	
Installation date	2018-11-20 19:32:33.316	**Additional information**	
PROFINET interface [X1]\General			
Name	PROFINET interface_1	**Author**	RobertDa
Comment			
PROFINET interface [X1]\General\Project information			
Name	DI 14/DQ 10_1	**Comment**	
Name	AI 2_1	**Comment**	
Name	AQ 1x12BIT_1	**Comment**	
PROFINET interface [X1]\General\Catalog information			
Short designation	AQ1 Signal board	**Description**	Signal board AQ1 x 12 bits; plug-in terminal blocks; output: +/-10V and 0 to 20 mA; configurable diagnostics; configurable substitute output value
Article number	6ES7 232-4HA30-0XB0	**Firmware version**	V1.0
PROFINET interface [X1]\Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
PROFINET interface [X1]\Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.103
Subnet mask:	255.0.0.0	**Use router**	False
PROFINET interface [X1]\Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	plc 103 process station - 4	**Converted name:**	plcxa103xaprocessxastationxa-xa415d5
Device number:	0		
PROFINET interface [X1]\Time synchronization			
Enable time synchronization via NTP server	Enable time synchronization via NTP server		IP addresses
Server 1	0.0.0.0	**Server 2**	0.0.0.0
Server 3	0.0.0.0	**Server 4**	0.0.0.0
Update interval	10sec		

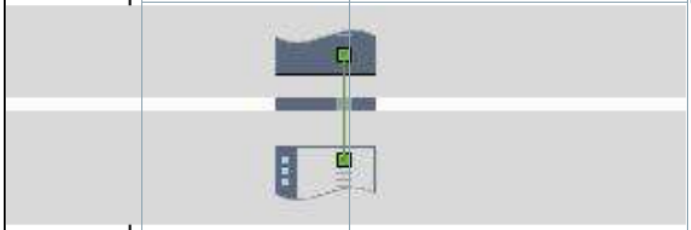
PROFINET interface [X1]\Digital inputs\Channel0			
Channel address	I0.0	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49152
Event name:	0	**Hardware interrupt:**	0
Rising edge0	Rising edge0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49280
Event name:	0	**Hardware interrupt:**	0
Falling edge0	Falling edge0		
PROFINET interface [X1]\Digital inputs\Channel1			
Channel address	I0.1	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49153
Event name:	0	**Hardware interrupt:**	0
Rising edge1	Rising edge1		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49281
Event name:	0	**Hardware interrupt:**	0
Falling edge1	Falling edge1		
PROFINET interface [X1]\Digital inputs\Channel2			
Channel address	I0.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49154
Event name:	0	**Hardware interrupt:**	0
Rising edge2	Rising edge2		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49282
Event name:	0	**Hardware interrupt:**	0
Falling edge2	Falling edge2		
PROFINET interface [X1]\Digital inputs\Channel3			
Channel address	I0.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49155
Event name:	0	**Hardware interrupt:**	0
Rising edge3	Rising edge3		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49283
Event name:	0	**Hardware interrupt:**	0
Falling edge3	Falling edge3		
PROFINET interface [X1]\Digital inputs\Channel4			
Channel address	I0.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49156
Event name:	0	**Hardware interrupt:**	0

Rising edge4	Rising edge4		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49284
Event name:	0	**Hardware interrupt:**	0
Falling edge4	Falling edge4		
PROFINET interface [X1]\Digital inputs\Channel5			
Channel address	I0.5	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49157
Event name:	0	**Hardware interrupt:**	0
Rising edge5	Rising edge5		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49285
Event name:	0	**Hardware interrupt:**	0
Falling edge5	Falling edge5		
PROFINET interface [X1]\Digital inputs\Channel6			
Channel address	I0.6	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49158
Event name:	0	**Hardware interrupt:**	0
Rising edge6	Rising edge6		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49286
Event name:	0	**Hardware interrupt:**	0
Falling edge6	Falling edge6		
PROFINET interface [X1]\Digital inputs\Channel7			
Channel address	I0.7	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49159
Event name:	0	**Hardware interrupt:**	0
Rising edge7	Rising edge7		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49287
Event name:	0	**Hardware interrupt:**	0
Falling edge7	Falling edge7		
PROFINET interface [X1]\Digital inputs\Channel8			
Channel address	I1.0	**Input filters**	0.1 microsec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel8			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49160
Event name:	0	**Hardware interrupt:**	0
Rising edge8	Rising edge8		
PROFINET interface [X1]\Digital inputs\Channel8			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49288
Event name:	0	**Hardware interrupt:**	0
Falling edge8	Falling edge8		

PROFINET interface [X1]\Digital inputs\Channel9			
Channel address	I1.1	**Input filters**	0.1 microsec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel9			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49161
Event name:	0	**Hardware interrupt:**	0
Rising edge9	Rising edge9		
PROFINET interface [X1]\Digital inputs\Channel9			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49289
Event name:	0	**Hardware interrupt:**	0
Falling edge9	Falling edge9		
PROFINET interface [X1]\Digital inputs\Channel10			
Channel address	I1.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel10			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49162
Event name:	0	**Hardware interrupt:**	0
Rising edge10	Rising edge10		
PROFINET interface [X1]\Digital inputs\Channel10			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49290
Event name:	0	**Hardware interrupt:**	0
Falling edge10	Falling edge10		
PROFINET interface [X1]\Digital inputs\Channel11			
Channel address	I1.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel11			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49163
Event name:	0	**Hardware interrupt:**	0
Rising edge11	Rising edge11		
PROFINET interface [X1]\Digital inputs\Channel11			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49291
Event name:	0	**Hardware interrupt:**	0
Falling edge11	Falling edge11		
PROFINET interface [X1]\Digital inputs\Channel12			
Channel address	I1.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel13			
Channel address	I1.5	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Analog inputs\Noise reduction			
Integration time	50 Hz (20 ms)		
PROFINET interface [X1]\Analog inputs\Channel0			
Channel address	IW64	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1
PROFINET interface [X1]\Analog inputs\Channel1			
Channel address	IW66	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1
PROFINET interface [X1]\Digital outputs			
Reaction to CPU STOP	Use substitute value		

PROFINET interface [X1]\Digital outputs\Channel0			
Channel address	Q0.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel1			
Channel address	Q0.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel2			
Channel address	Q0.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel3			
Channel address	Q0.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel4			
Channel address	Q0.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel5			
Channel address	Q0.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel6			
Channel address	Q0.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel7			
Channel address	Q0.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel8			
Channel address	Q1.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel9			
Channel address	Q1.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Operating mode			
IO controller	True	**IO system**	
Device number	0	**IO device**	False
PROFINET interface [X1]\Analog outputs			
Reaction to CPU STOP	Use substitute value		
PROFINET interface [X1]\Analog outputs\Channel0			
Channel address	QW80	**Analog output type**	Voltage
Voltage range	+/- 10 V	**Substitute value for channel on a change from RUN to STOP**	0.000V
		Enable short circuit diagnostics	1
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	0.0	**End address**	1.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	64	**End address**	67
Organization block	0	**Process image**	0

PROFINET interface [X1]\I/O addresses\Output addresses			
Start address	0.0	**End address**	1.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Output addresses			
Start address	80	**End address**	81
Organization block	0	**Process image**	0
PROFINET interface [X1]\Advanced options\Interface options			
Support device replacement without exchangeable medium	True	**Permit overwriting of device names of all assigned IO devices**	False
Use IEC V2.2 LLDP mode	False	**Keep-Alive connection monitoring:**	30s
PROFINET interface [X1]\Advanced options\Real time settings\IO communication			
Send clock:	1.000ms		
PROFINET interface [X1]\Advanced options\Real time settings\Real time options			
Calculated bandwidth for cyclic IO data:	0.000ms	**Calculated bandwidth for cyclic IO data:**	0.000%
PROFINET interface [X1]\Advanced options\Port [X1 P1]\General			
Name	Port_1	**Author**	RobertDa
Comment			
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Local port:			
Local port:	PLC 103 Process Station - 4\PROFINET interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Activate			
Activate this port for use	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Connection			
Transmission rate / duplex:	Automatic	**Monitor**	False
Enable autonegotiation	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Boundaries			
End of detection of accessible devices	False	**End of topology discovery**	False
End of the sync domain	False		
PROFINET interface [X1]\Web server access			
Enable Web server for the IP address of this interface	True	**The Web server must also be activated in the properties of the PLC.**	
High speed counters (HSC)\HSC1\General\Enable			
Enable this high speed counter	1	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0

Enable this high speed counter	0	**Enable this high speed counter**	0
High speed counters (HSC)\HSC1\General\Project information			
Name	HSC_1	**Comment**	
Name	HSC_2	**Comment**	
Name	HSC_3	**Comment**	
Name	HSC_4	**Comment**	
Name	HSC_5	**Comment**	
Name	HSC_6	**Comment**	
High speed counters (HSC)\HSC1\Function			
Type of counting	Count	**Operating phase**	A/B counter
		Counting direction is specified by	Input (external direction control)
Initial counting direction	Count up		
Frequency measuring period	-/-sec		
High speed counters (HSC)\HSC1\Reset to initial values\Initial values			
Initial counter value	5200	**Initial reference value**	0
High speed counters (HSC)\HSC1\Reset to initial values\Sync options			
Use external sync input	0	**Signal level of the sync input**	-/-
High speed counters (HSC)\HSC1\Event configuration			
Generate interrupt for counter value equals reference value event.	0		
High speed counters (HSC)\HSC1\Event configuration			
Generate interrupt for sync event.	0		
High speed counters (HSC)\HSC1\Event configuration			
Generate interrupt for change of direction event.	0		
High speed counters (HSC)\HSC1\Hardware inputs			
Clock generator A input	%I1.0	**Clock generator B input**	%I1.1
Sync input	---		
High speed counters (HSC)\HSC1\I/O addresses\Input addresses			
Start address	1004.0	**End address**	1007.7
Start address	1008.0	**End address**	1011.7
Organization block	0	**Start address**	1012.0
End address	1015.7	**Organization block**	0
Process image	0	**Start address**	1000.0
End address	1003.7	**Organization block**	0
Process image	0	**Start address**	1020.0
End address	1023.7	**Organization block**	0
Process image	0	**Organization block**	0
Process image	0	**Process image**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Enable			
Enable this pulse generator	1	**Enable this pulse generator**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Project information			
Name	Pulse_1	**Comment**	
Name	Pulse_2	**Comment**	
Pulse generators (PTO/PWM)\PTO1/PWM1\Parameter assignment\Pulse options			
Signal type	PWM	**Time base:**	Milliseconds
Pulse duration format	Hundredths	**Cycle time**	100ms
Initial pulse duration	50Hundredths		

Pulse generators (PTO/PWM)\PTO1/PWM1\Hardware outputs			
Pulse output	%Q1.1	**Enable direction output**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\I/O addresses\Output addresses			
Start address	1002.0	**End address**	1003.7
Start address	1000.0	**End address**	1001.7
Organization block	0	**Organization block**	0
Process image	0	**Process image**	0
Startup			
Startup after POWER ON	Warm restart - mode before POWER OFF	**Comparison preset to actual configuration**	Startup CPU even if mismatch
Configuration time	60000ms	**OBs should be interruptible**	1
Cycle			
Cycle monitoring time	150ms		
Enable minimum cycle time for cyclic OBs	0	**Minimum cycle time**	1ms
Communication load			
Cycle load due to communication	20%		
System and clock memory\System memory bits			
Enable the use of system memory byte	1	**Address of system memory byte (MBx)**	499
First cycle	%M499.0	**Diagnostic status changed**	%M499.1
Always 1 (high)	%M499.2	**Always 0 (low)**	%M499.3
System and clock memory\Clock memory bits			
Enable the use of clock memory byte	1	**Address of clock memory byte (MBx)**	500
10 Hz clock	%M500.0	**5 Hz clock**	%M500.1
2.5 Hz clock	%M500.2	**2 Hz clock**	%M500.3
1.25 Hz clock	%M500.4	**1 Hz clock**	%M500.5
0.625 Hz clock	%M500.6	**0.5 Hz clock**	%M500.7
Web server\General			
Activate Web server on all modules of this device	True	**Permit access only with HTTPS**	False
Web server\Automatic update			
Enable automatic update	True	**Update interval**	10s
Web server\User interface languages			

Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Web server\User management

User name	**User rights**
Everybody	Query diagnostics ,Read tags ,Write tags ,Read tag status ,Write tag status ,Open user-defined pages ,Write in user-defined web pages ,Read files ,Write/delete files ,Change operating mode ,Let LED flash ,Perform firmware update

Web server\User-defined web pages

Application name	**HTML source path**	**Default HTML page**	**Files with dynamic content**	**Web DB number**	**Fragment DB number**
	H:\Automation\Webserver Pages	PLC_103.html	.htm;.html	333	334

Web server\Overview of interfaces		
Device	**Interface**	**Enabled web server access**
PLC 103 Process Station - 4	PROFINET interface_1	True

User interface languages	
Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Time of day\Local time	
Time zone	(UTC +01:00) Berlin, Bern, Brussels, Rome, Stockholm, Vienna

Time of day\Daylight saving time			
Activate daylight saving time	1	**Difference between standard and daylight saving time**	60mins

Time of day\Daylight saving time\Start of daylight saving time			
Starting week of the month:	Last		Sunday
of	March	**at**	01:00 a.m.

Time of day\Daylight saving time\Start of standard time			
	Last		Sunday
of	October	**at**	02:00 a.m.

Protection & Security	
Level of protection	No protection

Protection & Security\Connection mechanisms	
Permit access with PUT/GET communication from remote partner	True

Configuration control\Configuration control for central configuration	
Allow to reconfigure the device via the user program	0

Connection resources

	Station resources - Reserved - Maximum	Station resources - Reserved - Configured	Station resources - Dynamic - Configured	Module resources - PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC] - Configured
Maximum number of resources:		62	6	68
	Maximum	Configured	Configured	Configured
PG communication:	4	-	-	-
HMI communication:	12	2	0	2
S7 communication:	8	1	0	1
Open user communication:	8	0	0	0
Web communication:	30	-	-	-
Other communication:	-	-	0	0
Total resources used:		3	0	3
Available resources:		59	6	65

Overview of addresses\Overview of addresses\Overview of addresses			
Inputs	True	**Outputs**	True
Address gaps	False	**Slot**	True

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
I	0	1	DI 14/DQ 10_1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 1
O	0	1	DI 14/DQ 10_1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 1
I	1004	1007	HSC_2	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 17
O	80	81	AQ 1x12BIT_1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 3
I	1008	1011	HSC_3	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 18
O	12	13	DQ 16x24VDC _1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	3
I	64	67	AI 2_1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 2
I	1020	1023	HSC_6	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 21
O	1004	1005	Pulse_3	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 34
I	1012	1015	HSC_4	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 19
I	1000	1003	HSC_1	Automatic update	PLC 103 Process	-	4 Bytes	-	0	1 16

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
					Station - 4 [CPU 1214C DC/DC/DC]					
O	1006	1007	Pulse_4	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 35
O	1002	1003	Pulse_2	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 33
I	8	9	DI 16x24VDC_1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	2
I	128	135	AI 4x13BIT_1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	8 Bytes	-	0	4
I	144	151	AI 4x13BIT/AQ 2x14BIT_1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	8 Bytes	-	0	5
O	144	147	AI 4x13BIT/AQ 2x14BIT_1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	5
I	1016	1019	HSC_5	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 20
O	1000	1001	Pulse_1	Automatic update	PLC 103 Process Station - 4 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 32

AQ 1x12BIT_1			
General\Project information			
Name	AQ 1x12BIT_1	**Comment**	
General\Catalog information			
Short designation	AQ1 Signal board	**Description**	Signal board AQ1 x 12 bits; plug-in terminal blocks; output: +/-10V and 0 to 20 mA; configurable diagnostics; configurable substitute output value
Article number	6ES7 232-4HA30-0XB0	**Firmware version**	V1.0

Analog outputs			
Reaction to CPU STOP	Use substitute value		
Analog outputs\Channel0			
Channel address	QW80	**Analog output type**	Voltage
Voltage range	+/- 10 V	**Substitute value for channel on a change from RUN to STOP**	0.000V
		Enable short circuit diagnostics	1
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
I/O addresses\Output addresses			
Start address	80	**End address**	81
Organization block	0	**Process image**	0

DI 16x24VDC_1			
General\Project information			
Name	DI 16x24VDC_1	**Author**	RobertDa
Comment		**Slot**	2
General\Catalog information			
Short designation	SM 1221 DI16 x 24VDC	**Description**	Digital input module DI16 x 24VDC SINK/SOURCE; configurable input delay; plug-in terminal blocks
Article number	6ES7 221-1BH32-0XB0	**Firmware version**	V2.0
DI 16\Project information			
Name	DI 16x24VDC_1	**Comment**	
DI 16\Digital inputs\Input filters			
I8.0 - I8.3	6.40ms	**I8.4 - I8.7**	6.40ms
I9.0 - I9.3	6.40ms	**I9.4 - I9.7**	6.40ms
DI 16\Digital inputs\Channel0			
Channel address	I8.0		
DI 16\Digital inputs\Channel1			
Channel address	I8.1		
DI 16\Digital inputs\Channel2			
Channel address	I8.2		
DI 16\Digital inputs\Channel3			
Channel address	I8.3		
DI 16\Digital inputs\Channel4			
Channel address	I8.4		
DI 16\Digital inputs\Channel5			
Channel address	I8.5		
DI 16\Digital inputs\Channel6			
Channel address	I8.6		
DI 16\Digital inputs\Channel7			
Channel address	I8.7		
DI 16\Digital inputs\Channel8			
Channel address	I9.0		
DI 16\Digital inputs\Channel9			
Channel address	I9.1		
DI 16\Digital inputs\Channel10			
Channel address	I9.2		
DI 16\Digital inputs\Channel11			
Channel address	I9.3		
DI 16\Digital inputs\Channel12			
Channel address	I9.4		
DI 16\Digital inputs\Channel13			
Channel address	I9.5		
DI 16\Digital inputs\Channel14			
Channel address	I9.6		

DI 16\Digital inputs\Channel15			
Channel address	I9.7		
DI 16\I/O addresses\Input addresses			
Start address	8.0	**End address**	9.7
Organization block	0	**Process image**	0

DQ 16x24VDC_1			
General\Project information			
Name	DQ 16x24VDC_1	**Author**	RobertDa
Comment		**Slot**	3
General\Catalog information			
Short designation	SM 1222 DQ16 x 24VDC	**Description**	Digital output module DQ16 x 24VDC; plug-in terminal blocks
Article number	6ES7 222-1BH32-0XB0	**Firmware version**	V2.0
DQ 16\Project information			
Name	DQ 16x24VDC_1	**Comment**	
DQ 16\Digital outputs			
Reaction to CPU STOP	Use substitute value		
DQ 16\Digital outputs\Channel0			
Channel address	Q12.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel1			
Channel address	Q12.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel2			
Channel address	Q12.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel3			
Channel address	Q12.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel4			
Channel address	Q12.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel5			
Channel address	Q12.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel6			
Channel address	Q12.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel7			
Channel address	Q12.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel8			
Channel address	Q13.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel9			
Channel address	Q13.1	**Substitute a value of 1 on a change from RUN to STOP.**	0

DQ 16\Digital outputs\Channel10			
Channel address	Q13.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel11			
Channel address	Q13.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel12			
Channel address	Q13.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel13			
Channel address	Q13.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel14			
Channel address	Q13.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\Digital outputs\Channel15			
Channel address	Q13.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
DQ 16\I/O addresses\Output addresses			
Start address	12.0	**End address**	13.7
Organization block	0	**Process image**	0

AI 4x13BIT_1			
General\Project information			
Name	AI 4x13BIT_1	**Author**	RobertDa
Comment		**Slot**	4
General\Catalog information			
Short designation	SM 1231 AI4	**Description**	Analog input module AI4 x 13 bits; plug-in terminal blocks; inputs: 2.5V, 5V 10V and 0/4 to 20mA; configurable frequency suppression; configurable smoothing; configurable diagnostics
Article number	6ES7 231-4HD32-0XB0	**Firmware version**	V2.0
AI 4\Project information			
Name	AI 4x13BIT_1	**Comment**	
AI 4\Module diagnostics			
Enable power supply diagnostics	1	**Additional diagnostics may be selected for each input/output.**	
AI 4\Analog inputs\Noise reduction			
Integration time	50 Hz (20 ms)		
AI 4\Analog inputs\Channel0			
Channel address	IW128	**Measurement type**	Current
Current range	4..20 mA	**Smoothing**	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diag-nostics	1	**Enable underflow di-agnostics**	0
AI 4\Analog inputs\Channel1			
Channel address	IW130	**Measurement type**	Current
Current range	4..20 mA	**Smoothing**	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diag-nostics	1	**Enable underflow di-agnostics**	0

AI 4\Analog inputs\Channel2			
Channel address	IW132	Measurement type	Voltage
Voltage range	+/- 10 V	Smoothing	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diagnostics	1	Enable underflow diagnostics	1
AI 4\Analog inputs\Channel3			
Channel address	IW134	Measurement type	Voltage
Voltage range	+/- 10 V	Smoothing	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diagnostics	1	Enable underflow diagnostics	1
AI 4\I/O addresses\Input addresses			
Start address	128	End address	135
Organization block	0	Process image	0

AI 4x13BIT/AQ 2x14BIT_1			
General\Project information			
Name	AI 4x13BIT/AQ 2x14BIT_1	Author	RobertDa
Comment		Slot	5
General\Catalog information			
Short designation	SM 1234 AI4/AQ2	Description	Analog input/output module AI4 + AQ2; plug-in terminal blocks; inputs: 13 bits, 2.5V, 5V, 10V and 0/4 to 20 mA; selectable frequency suppression; selectable smoothing; configurable diagnostics; outputs: +/-10V and 0 to 20 mA; configurable diagnostics; configurable substitute value for output
Article number	6ES7 234-4HE32-0XB0	Firmware version	V2.0
AI 4/AQ 2\Project information			
Name	AI 4x13BIT/AQ 2x14BIT_1	Comment	
AI 4/AQ 2\Module diagnostics			
Enable power supply diagnostics	1	Additional diagnostics may be selected for each input/output.	
AI 4/AQ 2\Analog inputs\Noise reduction			
Integration time	50 Hz (20 ms)		
AI 4/AQ 2\Analog inputs\Channel0			
Channel address	IW144	Measurement type	Voltage
Voltage range	+/- 10 V	Smoothing	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diagnostics	1	Enable underflow diagnostics	1
AI 4/AQ 2\Analog inputs\Channel1			
Channel address	IW146	Measurement type	Voltage
Voltage range	+/- 10 V	Smoothing	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diagnostics	1	Enable underflow diagnostics	1
AI 4/AQ 2\Analog inputs\Channel2			
Channel address	IW148	Measurement type	Voltage
Voltage range	+/- 10 V	Smoothing	Weak (4 cycles)
		Enable broken wire diagnostics	0

Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
AI 4/AQ 2\Analog inputs\Channel3			
Channel address	IW150	**Measurement type**	Voltage
Voltage range	+/- 10 V	**Smoothing**	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
AI 4/AQ 2\Analog outputs			
Reaction to CPU STOP	Use substitute value		
AI 4/AQ 2\Analog outputs\Channel0			
Channel address	QW144	**Analog output type**	Voltage
Voltage range	+/- 10 V	**Substitute value for channel on a change from RUN to STOP**	0.000V
		Enable short circuit diagnostics	1
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
AI 4/AQ 2\Analog outputs\Channel1			
Channel address	QW146	**Analog output type**	Voltage
Voltage range	+/- 10 V	**Substitute value for channel on a change from RUN to STOP**	0.000V
		Enable short circuit diagnostics	1
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
AI 4/AQ 2\I/O addresses\Input addresses			
Start address	144	**End address**	151
Organization block	0	**Process image**	0
AI 4/AQ 2\I/O addresses\Output addresses			
Start address	144	**End address**	147
Organization block	0	**Process image**	0

CIM Complete System with Simulation Inputs_V16 / Devices & networks

S7-1200 station_4

PLC 104 Hydraulic Station - 5			
General\Project information			
Name	PLC 104 Hydraulic Station - 5	**Author**	RobertDa
Comment		**Slot**	1
Rack	0		
General\Catalog information			
Short designation	CPU 1214C DC/DC/DC	**Description**	Work memory 100 KB; 24VDC power supply with DI14 x 24VDC SINK/ SOURCE, DQ10 x 24VDC and AI2 on board; 6 high-speed counters and 4 pulse outputs on board; signal board expands on-board I/O; up to 3 communication modules for serial communication; up to 8 signal modules for I/O expansion; PROFINET interface for programming, HMI and PLC to PLC communication
Article number	6ES7 214-1AG40-0XB0	**Firmware version**	V4.1
General\Identification & Maintenance			
Plant designation		**Location identifier**	
Installation date	2018-11-20 19:33:07.548	**Additional information**	
PROFINET interface [X1]\General			
Name	PROFINET interface_1	**Author**	RobertDa
Comment			
PROFINET interface [X1]\General\Project information			
Name	DI 14/DQ 10_1	**Comment**	
Name	AI 2_1	**Comment**	
Name	AQ 1x12BIT_1	**Comment**	
PROFINET interface [X1]\General\Catalog information			
Short designation	AQ1 Signal board	**Description**	Signal board AQ1 x 12 bits; plug-in terminal blocks; output: +/-10V and 0 to 20 mA; configurable diagnostics; configurable substitute output value
Article number	6ES7 232-4HA30-0XB0	**Firmware version**	V1.0
PROFINET interface [X1]\Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
PROFINET interface [X1]\Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.104
Subnet mask:	255.0.0.0	**Use router**	False
PROFINET interface [X1]\Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	plc 104 hydraulic station - 5	**Converted name:**	plcxa104xahydraulicxastationxa-xa5fb98
Device number:	0		
PROFINET interface [X1]\Time synchronization			
Enable time synchronization via NTP server	Enable time synchronization via NTP server		IP addresses
Server 1	0.0.0.0	**Server 2**	0.0.0.0
Server 3	0.0.0.0	**Server 4**	0.0.0.0
Update interval	10sec		

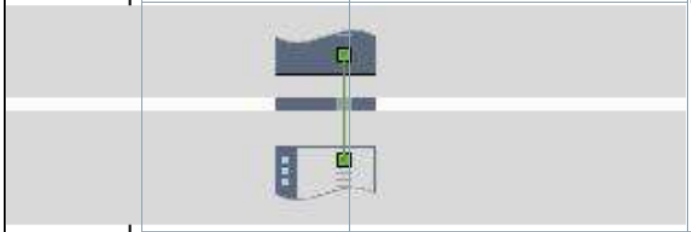
PROFINET interface [X1]\Digital inputs\Channel0			
Channel address	I0.0	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49152
Event name:	0	**Hardware interrupt:**	0
Rising edge0	Rising edge0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49280
Event name:	0	**Hardware interrupt:**	0
Falling edge0	Falling edge0		
PROFINET interface [X1]\Digital inputs\Channel1			
Channel address	I0.1	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49153
Event name:	0	**Hardware interrupt:**	0
Rising edge1	Rising edge1		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49281
Event name:	0	**Hardware interrupt:**	0
Falling edge1	Falling edge1		
PROFINET interface [X1]\Digital inputs\Channel2			
Channel address	I0.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49154
Event name:	0	**Hardware interrupt:**	0
Rising edge2	Rising edge2		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49282
Event name:	0	**Hardware interrupt:**	0
Falling edge2	Falling edge2		
PROFINET interface [X1]\Digital inputs\Channel3			
Channel address	I0.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49155
Event name:	0	**Hardware interrupt:**	0
Rising edge3	Rising edge3		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49283
Event name:	0	**Hardware interrupt:**	0
Falling edge3	Falling edge3		
PROFINET interface [X1]\Digital inputs\Channel4			
Channel address	I0.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49156
Event name:	0	**Hardware interrupt:**	0

Rising edge4	Rising edge4		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49284
Event name:	0	**Hardware interrupt:**	0
Falling edge4	Falling edge4		
PROFINET interface [X1]\Digital inputs\Channel5			
Channel address	I0.5	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49157
Event name:	0	**Hardware interrupt:**	0
Rising edge5	Rising edge5		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49285
Event name:	0	**Hardware interrupt:**	0
Falling edge5	Falling edge5		
PROFINET interface [X1]\Digital inputs\Channel6			
Channel address	I0.6	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49158
Event name:	0	**Hardware interrupt:**	0
Rising edge6	Rising edge6		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49286
Event name:	0	**Hardware interrupt:**	0
Falling edge6	Falling edge6		
PROFINET interface [X1]\Digital inputs\Channel7			
Channel address	I0.7	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49159
Event name:	0	**Hardware interrupt:**	0
Rising edge7	Rising edge7		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49287
Event name:	0	**Hardware interrupt:**	0
Falling edge7	Falling edge7		
PROFINET interface [X1]\Digital inputs\Channel8			
Channel address	I1.0	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel8			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49160
Event name:	0	**Hardware interrupt:**	0
Rising edge8	Rising edge8		
PROFINET interface [X1]\Digital inputs\Channel8			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49288
Event name:	0	**Hardware interrupt:**	0
Falling edge8	Falling edge8		

PROFINET interface [X1]\Digital inputs\Channel9			
Channel address	I1.1	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel9			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49161
Event name:	0	**Hardware interrupt:**	0
Rising edge9	Rising edge9		
PROFINET interface [X1]\Digital inputs\Channel9			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49289
Event name:	0	**Hardware interrupt:**	0
Falling edge9	Falling edge9		
PROFINET interface [X1]\Digital inputs\Channel10			
Channel address	I1.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel10			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49162
Event name:	0	**Hardware interrupt:**	0
Rising edge10	Rising edge10		
PROFINET interface [X1]\Digital inputs\Channel10			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49290
Event name:	0	**Hardware interrupt:**	0
Falling edge10	Falling edge10		
PROFINET interface [X1]\Digital inputs\Channel11			
Channel address	I1.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel11			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49163
Event name:	0	**Hardware interrupt:**	0
Rising edge11	Rising edge11		
PROFINET interface [X1]\Digital inputs\Channel11			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49291
Event name:	0	**Hardware interrupt:**	0
Falling edge11	Falling edge11		
PROFINET interface [X1]\Digital inputs\Channel12			
Channel address	I1.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel13			
Channel address	I1.5	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Analog inputs\Noise reduction			
Integration time	50 Hz (20 ms)		
PROFINET interface [X1]\Analog inputs\Channel0			
Channel address	IW64	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1
PROFINET interface [X1]\Analog inputs\Channel1			
Channel address	IW66	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1
PROFINET interface [X1]\Digital outputs			
Reaction to CPU STOP	Use substitute value		

PROFINET interface [X1]\Digital outputs\Channel0			
Channel address	Q0.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel1			
Channel address	Q0.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel2			
Channel address	Q0.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel3			
Channel address	Q0.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel4			
Channel address	Q0.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel5			
Channel address	Q0.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel6			
Channel address	Q0.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel7			
Channel address	Q0.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel8			
Channel address	Q1.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel9			
Channel address	Q1.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Operating mode			
IO controller	True	**IO system**	
Device number	0	**IO device**	False
PROFINET interface [X1]\Analog outputs			
Reaction to CPU STOP	Use substitute value		
PROFINET interface [X1]\Analog outputs\Channel0			
Channel address	QW80	**Analog output type**	Voltage
Voltage range	+/- 10 V	**Substitute value for channel on a change from RUN to STOP**	0.000V
		Enable short circuit diagnostics	1
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	0.0	**End address**	1.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	64	**End address**	67
Organization block	0	**Process image**	0

PROFINET interface [X1]\I/O addresses\Output addresses			
Start address	0.0	**End address**	1.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Output addresses			
Start address	80	**End address**	81
Organization block	0	**Process image**	0
PROFINET interface [X1]\Advanced options\Interface options			
Support device replacement without exchangeable medium	True	**Permit overwriting of device names of all assigned IO devices**	False
Use IEC V2.2 LLDP mode	False	**Keep-Alive connection monitoring:**	30s
PROFINET interface [X1]\Advanced options\Real time settings\IO communication			
Send clock:	1.000ms		
PROFINET interface [X1]\Advanced options\Real time settings\Real time options			
Calculated bandwidth for cyclic IO data:	0.000ms	**Calculated bandwidth for cyclic IO data:**	0.000%
PROFINET interface [X1]\Advanced options\Port [X1 P1]\General			
Name	Port_1	**Author**	RobertDa
Comment			
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Local port:			
Local port:	PLC 104 Hydraulic Station - 5\PROFINET interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Activate			
Activate this port for use	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Connection			
Transmission rate / duplex:	Automatic	**Monitor**	False
Enable autonegotiation	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Boundaries			
End of detection of accessible devices	False	**End of topology discovery**	False
End of the sync domain	False		
PROFINET interface [X1]\Web server access			
Enable Web server for the IP address of this interface	True	**The Web server must also be activated in the properties of the PLC.**	
High speed counters (HSC)\HSC1\General\Enable			
Enable this high speed counter	0	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0

Enable this high speed counter	0	**Enable this high speed counter**	0
High speed counters (HSC)\HSC1\General\Project information			
Name	HSC_1	**Comment**	
Name	HSC_2	**Comment**	
Name	HSC_3	**Comment**	
Name	HSC_4	**Comment**	
Name	HSC_5	**Comment**	
Name	HSC_6	**Comment**	
High speed counters (HSC)\HSC1\I/O addresses\Input addresses			
Start address	1000.0	**End address**	1003.7
Start address	1004.0	**End address**	1007.7
Organization block	0	**Start address**	1008.0
End address	1011.7	**Organization block**	0
Process image	0	**Start address**	1012.0
End address	1015.7	**Organization block**	0
Process image	0	**Start address**	1016.0
End address	1019.7	**Organization block**	0
Process image	0	**Start address**	1020.0
End address	1023.7	**Organization block**	0
Process image	0	**Organization block**	0
Process image	0	**Process image**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Enable			
Enable this pulse generator	1	**Enable this pulse generator**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Project information			
Name	Pulse_1	**Comment**	
Name	Pulse_2	**Comment**	
Pulse generators (PTO/PWM)\PTO1/PWM1\Parameter assignment\Pulse options			
Signal type	PWM	**Time base:**	Milliseconds
Pulse duration format	Hundredths	**Cycle time**	1ms
Initial pulse duration	1Hundredths		
Pulse generators (PTO/PWM)\PTO1/PWM1\Hardware outputs			
Pulse output	%Q0.3	**Enable direction output**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\I/O addresses\Output addresses			
Start address	1002.0	**End address**	1003.7
Start address	1000.0	**End address**	1001.7
Organization block	0	**Organization block**	0
Process image	0	**Process image**	0
Startup			
Startup after POWER ON	Warm restart - mode before POWER OFF	**Comparison preset to actual configuration**	Startup CPU even if mismatch
Configuration time	60000ms	**OBs should be interruptible**	1
Cycle			
Cycle monitoring time	150ms		
Enable minimum cycle time for cyclic OBs	0	**Minimum cycle time**	1ms
Communication load			
Cycle load due to communication	20%		
System and clock memory\System memory bits			
Enable the use of system memory byte	1	**Address of system memory byte (MBx)**	499
First cycle	%M499.0 (FirstScan)	**Diagnostic status changed**	%M499.1 (DiagStatusUpdate)
Always 1 (high)	%M499.2 (AlwaysTRUE)	**Always 0 (low)**	%M499.3 (AlwaysFALSE)

System and clock memory\Clock memory bits			
Enable the use of clock memory byte	1	**Address of clock memory byte (MBx)**	500
10 Hz clock	%M500.0 (Clock_10Hz)	**5 Hz clock**	%M500.1 (Clock_5Hz)
2.5 Hz clock	%M500.2 (Clock_2.5Hz)	**2 Hz clock**	%M500.3 (Clock_2Hz)
1.25 Hz clock	%M500.4 (Clock_1.25Hz)	**1 Hz clock**	%M500.5 (Clock_1Hz)
0.625 Hz clock	%M500.6 (Clock_0.625Hz)	**0.5 Hz clock**	%M500.7 (Clock_0.5Hz)

Web server\General			
Activate Web server on all modules of this device	True	**Permit access only with HTTPS**	False

Web server\Automatic update			
Enable automatic update	True	**Update interval**	10s

Web server\User interface languages	
Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Web server\User management	
User name	**User rights**
Everybody	Query diagnostics ,Read tags ,Write tags ,Read tag status ,Write tag status ,Open user-defined pages ,Write in user-defined web pages ,Read files ,Write/delete files ,Change operating mode ,Let LED flash ,Perform firmware update

Web server\User-defined web pages					
Application name	**HTML source path**	**Default HTML page**	**Files with dynamic content**	**Web DB number**	**Fragment DB number**
	H:\Automation\Webserver Pages	PLC_104.html	.htm;.html	333	334

Web server\Overview of interfaces		
Device	**Interface**	**Enabled web server access**
PLC 104 Hydraulic Station - 5	PROFINET interface_1	True

User interface languages	
Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Time of day\Local time	
Time zone	(UTC +01:00) Berlin, Bern, Brussels, Rome, Stockholm, Vienna

Time of day\Daylight saving time			
Activate daylight saving time	1	**Difference between standard and daylight saving time**	60mins

Time of day\Daylight saving time\Start of daylight saving time			
Starting week of the month:	Last		Sunday
of	March	**at**	01:00 a.m.

Time of day\Daylight saving time\Start of standard time			
	Last		Sunday
of	October	**at**	02:00 a.m.

Protection & Security			
Level of protection	No protection		
Protection & Security\Connection mechanisms			
Permit access with PUT/GET communication from remote partner	True		
Configuration control\Configuration control for central configuration			
Allow to reconfigure the device via the user program	0		

Connection resources

	Station resources - Reserved - Maximum	Station resources - Reserved - Configured	Station resources - Dynamic - Configured	Module resources - PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC] - Configured
Maximum number of resources:		62	6	68
	Maximum	Configured	Configured	Configured
PG communication:	4	-	-	-
HMI communication:	12	1	0	1
S7 communication:	8	1	0	1
Open user communication:	8	0	0	0
Web communication:	30	-	-	-
Other communication:	-	-	0	0
Total resources used:		2	0	2
Available resources:		60	6	66

Overview of addresses\Overview of addresses\Overview of addresses			
Inputs	True	**Outputs**	True
Address gaps	False	**Slot**	True

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
I	0	1	DI 14/DQ 10_1	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 1
O	0	1	DI 14/DQ 10_1	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 1
I	1004	1007	HSC_2	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 17
O	80	81	AQ 1x12BIT_1	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 3
I	1008	1011	HSC_3	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 18
I	64	67	AI 2_1	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 2
I	1020	1023	HSC_6	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 21
O	1004	1005	Pulse_3	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 34
O	1000	1001	Pulse_1	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 32
I	1012	1015	HSC_4	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 19
I	1000	1003	HSC_1	Automatic update	PLC 104 Hydraulic	-	4 Bytes	-	0	1 16

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
					Station - 5 [CPU 1214C DC/DC/DC]					
O	1006	1007	Pulse_4	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 35
O	1002	1003	Pulse_2	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	2 Bytes	-	0	1 33
I	96	103	AI 4x13BIT_1	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	8 Bytes	-	0	3
I	1016	1019	HSC_5	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	4 Bytes	-	0	1 20
I	8	8	DI 8/DQ 8x24VDC_1	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	1 Bytes	-	0	2
O	8	8	DI 8/DQ 8x24VDC_1	Automatic update	PLC 104 Hydraulic Station - 5 [CPU 1214C DC/DC/DC]	-	1 Bytes	-	0	2

AQ 1x12BIT_1			
General\Project information			
Name	AQ 1x12BIT_1	**Comment**	
General\Catalog information			
Short designation	AQ1 Signal board	**Description**	Signal board AQ1 x 12 bits; plug-in terminal blocks; output: +/-10V and 0 to 20 mA; configurable diagnostics; configurable substitute output value
Article number	6ES7 232-4HA30-0XB0	**Firmware version**	V1.0
Analog outputs			
Reaction to CPU STOP	Use substitute value		
Analog outputs\Channel0			
Channel address	QW80	**Analog output type**	Voltage
Voltage range	+/- 10 V	**Substitute value for channel on a change from RUN to STOP**	0.000V
		Enable short circuit diagnostics	1
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1

I/O addresses\Output addresses			
Start address	80	**End address**	81
Organization block	0	**Process image**	0

DI 8/DQ 8x24VDC_1			
General\Project information			
Name	DI 8/DQ 8x24VDC_1	**Author**	JE217806
Comment		**Slot**	2
General\Catalog information			
Short designation	SM 1223 DI8/DQ8 x 24VDC	**Description**	Digital input/output module DI8 x 24VDC SINK/SOURCE and DQ8 x 24VDC; configurable input delay; plug-in terminal blocks
Article number	6ES7 223-1BH32-0XB0	**Firmware version**	V2.0
DI 8/DQ 8\Project information			
Name	DI 8/DQ 8x24VDC_1	**Comment**	
DI 8/DQ 8\Digital inputs\Input filters			
I8.0 - I8.3	6.40ms	**I8.4 - I8.7**	6.40ms
DI 8/DQ 8\Digital inputs\Channel0			
Channel address	I8.0		
DI 8/DQ 8\Digital inputs\Channel1			
Channel address	I8.1		
DI 8/DQ 8\Digital inputs\Channel2			
Channel address	I8.2		
DI 8/DQ 8\Digital inputs\Channel3			
Channel address	I8.3		
DI 8/DQ 8\Digital inputs\Channel4			
Channel address	I8.4		
DI 8/DQ 8\Digital inputs\Channel5			
Channel address	I8.5		
DI 8/DQ 8\Digital inputs\Channel6			
Channel address	I8.6		
DI 8/DQ 8\Digital inputs\Channel7			
Channel address	I8.7		
DI 8/DQ 8\Digital outputs			
Reaction to CPU STOP	Use substitute value		
DI 8/DQ 8\Digital outputs\Channel0			
Channel address	Q8.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
DI 8/DQ 8\Digital outputs\Channel1			
Channel address	Q8.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
DI 8/DQ 8\Digital outputs\Channel2			
Channel address	Q8.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
DI 8/DQ 8\Digital outputs\Channel3			
Channel address	Q8.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
DI 8/DQ 8\Digital outputs\Channel4			
Channel address	Q8.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
DI 8/DQ 8\Digital outputs\Channel5			
Channel address	Q8.5	**Substitute a value of 1 on a change from RUN to STOP.**	0

DI 8/DQ 8\Digital outputs\Channel6			
Channel address	Q8.6	**Substitute a value of 1 on a change from RUN to STOP.**	0
DI 8/DQ 8\Digital outputs\Channel7			
Channel address	Q8.7	**Substitute a value of 1 on a change from RUN to STOP.**	0
DI 8/DQ 8\I/O addresses\Input addresses			
Start address	8.0	**End address**	8.7
Organization block	0	**Process image**	0
DI 8/DQ 8\I/O addresses\Output addresses			
Start address	8.0	**End address**	8.7
Organization block	0	**Process image**	0

AI 4x13BIT_1			
General\Project information			
Name	AI 4x13BIT_1	**Author**	RobertDa
Comment		**Slot**	3
General\Catalog information			
Short designation	SM 1231 AI4	**Description**	Analog input module AI4 x 13 bits; plug-in terminal blocks; inputs: 2.5V, 5V 10V and 0/4 to 20mA; configurable frequency suppression; configurable smoothing; configurable diagnostics
Article number	6ES7 231-4HD32-0XB0	**Firmware version**	V2.0
AI 4\Project information			
Name	AI 4x13BIT_1	**Comment**	
AI 4\Module diagnostics			
Enable power supply diagnostics	1	**Additional diagnostics may be selected for each input/output.**	
AI 4\Analog inputs\Noise reduction			
Integration time	50 Hz (20 ms)		
AI 4\Analog inputs\Channel0			
Channel address	IW96	**Measurement type**	Voltage
Voltage range	+/- 10 V	**Smoothing**	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
AI 4\Analog inputs\Channel1			
Channel address	IW98	**Measurement type**	Voltage
Voltage range	+/- 10 V	**Smoothing**	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
AI 4\Analog inputs\Channel2			
Channel address	IW100	**Measurement type**	Voltage
Voltage range	+/- 10 V	**Smoothing**	Weak (4 cycles)
		Enable broken wire diagnostics	0
Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
AI 4\Analog inputs\Channel3			
Channel address	IW102	**Measurement type**	Voltage
Voltage range	+/- 10 V	**Smoothing**	Weak (4 cycles)
		Enable broken wire diagnostics	0

Enable overflow diagnostics	1	**Enable underflow diagnostics**	1
AI 4\I/O addresses\Input addresses			
Start address	96	**End address**	103
Organization block	0	**Process image**	0

CIM Complete System with Simulation Inputs_V16 / Devices & networks

S7-1200 station_5

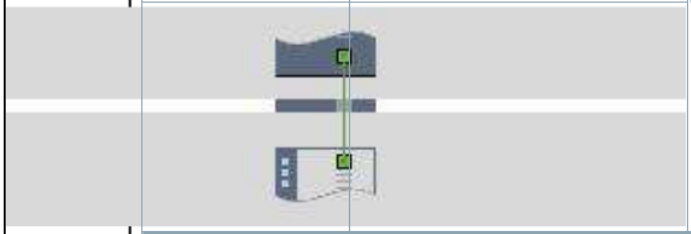
PLC 105 Water Recirculation System			
General\Project information			
Name	PLC 105 Water Recirculation System	**Author**	RobertDa
Comment		**Slot**	1
Rack	0		
General\Catalog information			
Short designation	CPU 1212C AC/DC/Rly	**Description**	Work memory 50 KB; 120/240VAC power supply with DI8 x 24VDC SINK/SOURCE, DQ6 x relay and AI2 on board; 4 high-speed counters (expandable with digital signal board) and 4 pulse outputs on board; signal board expands on-board I/O; up to 3 communication modules for serial communication; up to 2 signal modules for I/O expansion; PROFINET interface for programming, HMI and PLC-to-PLC communication
Article number	6ES7 212-1BE40-0XB0	**Firmware version**	V4.0
General\Identification & Maintenance			
Plant designation		**Location identifier**	
Installation date	2018-11-20 19:33:53.477	**Additional information**	
Connection resources			
PG communication:	1	**OP communication:**	1
S7 basic communication:	0	**S7 communication:**	1
Maximum number of S7 connection resources:	38		
PROFINET interface [X1]\General			
Name	PROFINET interface_1	**Author**	RobertDa
Comment			
PROFINET interface [X1]\General\Project information			
Name	DI 8/DQ 6_1	**Comment**	
Name	AI 2_1	**Comment**	
Name	DQ 4x5VDC_1	**Comment**	
PROFINET interface [X1]\General\Catalog information			
Short designation	DQ4 signal board (200 kHz)	**Description**	Signal board DQ4 x 24VDC / 200 kHz; plug-in terminal blocks
Article number	6ES7 222-1BD30-0XB0	**Firmware version**	V1.0
PROFINET interface [X1]\Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
PROFINET interface [X1]\Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.105
Subnet mask:	255.0.0.0	**Use router**	False
PROFINET interface [X1]\Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	plc 105 water recirculation system	**Converted name:**	plcxa105xawaterxarecirculationxasystem9cd1
Device number:	0		

PROFINET interface [X1]\Time synchronization			
Enable time synchronization via NTP server	Enable time synchronization via NTP server		IP addresses
Server 1	0.0.0.0	**Server 2**	0.0.0.0
Server 3	0.0.0.0	**Server 4**	0.0.0.0
Update interval	10sec		
PROFINET interface [X1]\Digital inputs\Channel0			
Channel address	I0.0	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49152
Event name:	0	**Hardware interrupt:**	0
Rising edge0	Rising edge0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49280
Event name:	0	**Hardware interrupt:**	0
Falling edge0	Falling edge0		
PROFINET interface [X1]\Digital inputs\Channel1			
Channel address	I0.1	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49153
Event name:	0	**Hardware interrupt:**	0
Rising edge1	Rising edge1		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49281
Event name:	0	**Hardware interrupt:**	0
Falling edge1	Falling edge1		
PROFINET interface [X1]\Digital inputs\Channel2			
Channel address	I0.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49154
Event name:	0	**Hardware interrupt:**	0
Rising edge2	Rising edge2		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49282
Event name:	0	**Hardware interrupt:**	0
Falling edge2	Falling edge2		
PROFINET interface [X1]\Digital inputs\Channel3			
Channel address	I0.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49155
Event name:	0	**Hardware interrupt:**	0
Rising edge3	Rising edge3		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49283
Event name:	0	**Hardware interrupt:**	0
Falling edge3	Falling edge3		

PROFINET interface [X1]\Digital inputs\Channel4			
Channel address	I0.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49156
Event name:	0	**Hardware interrupt:**	0
Rising edge4	Rising edge4		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49284
Event name:	0	**Hardware interrupt:**	0
Falling edge4	Falling edge4		
PROFINET interface [X1]\Digital inputs\Channel5			
Channel address	I0.5	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49157
Event name:	0	**Hardware interrupt:**	0
Rising edge5	Rising edge5		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49285
Event name:	0	**Hardware interrupt:**	0
Falling edge5	Falling edge5		
PROFINET interface [X1]\Digital inputs\Channel6			
Channel address	I0.6	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49158
Event name:	0	**Hardware interrupt:**	0
Rising edge6	Rising edge6		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49286
Event name:	0	**Hardware interrupt:**	0
Falling edge6	Falling edge6		
PROFINET interface [X1]\Digital inputs\Channel7			
Channel address	I0.7	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49159
Event name:	0	**Hardware interrupt:**	0
Rising edge7	Rising edge7		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49287
Event name:	0	**Hardware interrupt:**	0
Falling edge7	Falling edge7		
PROFINET interface [X1]\Analog inputs\Noise reduction			
Integration time	50 Hz (20 ms)		
PROFINET interface [X1]\Analog inputs\Channel0			
Channel address	IW64	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1

PROFINET interface [X1]\Analog inputs\Channel1			
Channel address	IW66	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diagnostics	1
PROFINET interface [X1]\Digital outputs			
Reaction to CPU STOP	Use substitute value	**Reaction to CPU STOP**	Use substitute value
PROFINET interface [X1]\Digital outputs\Channel0			
Channel address	Q0.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
Channel address	Q4.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel1			
Channel address	Q0.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
Channel address	Q4.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel2			
Channel address	Q0.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
Channel address	Q4.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel3			
Channel address	Q0.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
Channel address	Q4.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel4			
Channel address	Q0.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel5			
Channel address	Q0.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Operating mode			
IO controller	True	**IO system**	
Device number	0	**IO device**	False
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	0.0	**End address**	0.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	64	**End address**	67
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Output addresses			
Start address	0.0	**End address**	0.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\Advanced options\Interface options			
Support device replacement without exchangeable medium	True	**Use IEC V2.2 LLDP mode**	True

Keep-Alive connection monitoring:	30s		
PROFINET interface [X1]\Advanced options\Real time settings\IO communication			
Send clock:	1.000ms		
PROFINET interface [X1]\Advanced options\Real time settings\Real time options			
Calculated bandwidth for cyclic IO data:	0.000ms	**Calculated bandwidth for cyclic IO data:**	0.000%
PROFINET interface [X1]\Advanced options\Port [X1 P1]\General			
Name	Port_1	**Author**	RobertDa
Comment			
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Local port:			
Local port:	PLC 105 Water Recirculation System \PROFINET interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Activate			
Activate this port for use	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Connection			
Transmission rate / duplex:	Automatic	**Monitor**	False
Enable autonegotiation	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Boundaries			
End of detection of accessible devices	False	**End of topology discovery**	False
End of the sync domain	False		
High speed counters (HSC)\HSC1\General\Enable			
Enable this high speed counter	0	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0
High speed counters (HSC)\HSC1\General\Project information			
Name	HSC_1	**Comment**	
Name	HSC_2	**Comment**	
Name	HSC_3	**Comment**	
Name	HSC_4	**Comment**	
Name	HSC_5	**Comment**	
Name	HSC_6	**Comment**	
High speed counters (HSC)\HSC1\I/O addresses\Input addresses			
Start address	1000.0	**End address**	1003.7
Start address	1004.0	**End address**	1007.7
Organization block	0	**Start address**	1008.0
End address	1011.7	**Organization block**	0
Process image	0	**Start address**	1012.0

End address	1015.7	**Organization block**	0
Process image	0	**Start address**	1016.0
End address	1019.7	**Organization block**	0
Process image	0	**Start address**	1020.0
End address	1023.7	**Organization block**	0
Process image	0	**Organization block**	0
Process image	0	**Process image**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Enable			
Enable this pulse generator	1	**Enable this pulse generator**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Project information			
Name	Pulse_1	**Comment**	
Name	Pulse_2	**Comment**	
Pulse generators (PTO/PWM)\PTO1/PWM1\Parameter assignment\Pulse options			
Signal type	PWM	**Time base:**	Microseconds
Pulse duration format	Hundredths	**Cycle time**	100µs
Initial pulse duration	50Hundredths		
Pulse generators (PTO/PWM)\PTO1/PWM1\Hardware outputs			
Pulse output	%Q4.0	**Enable direction output**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\I/O addresses\Output addresses			
Start address	1002.0	**End address**	1003.7
Start address	1000.0	**End address**	1001.7
Organization block	0	**Organization block**	0
Process image	0	**Process image**	0
Startup			
Startup after POWER ON	Warm restart - mode before POWER OFF	**Comparison preset to actual configuration**	Startup CPU even if mismatch
Configuration time	60000ms	**OBs should be interruptible**	1
Cycle			
Cycle monitoring time	150ms		
Enable minimum cycle time for cyclic OBs	0	**Minimum cycle time**	1ms
Communication load			
Cycle load due to communication	20%		
System and clock memory\System memory bits			
Enable the use of system memory byte	1	**Address of system memory byte (MBx)**	499
First cycle	%M499.0 (FirstScan)	**Diagnostic status changed**	%M499.1 (DiagStatusUpdate)
Always 1 (high)	%M499.2 (AlwaysTRUE)	**Always 0 (low)**	%M499.3 (AlwaysFALSE)
System and clock memory\Clock memory bits			
Enable the use of clock memory byte	1	**Address of clock memory byte (MBx)**	500
10 Hz clock	%M500.0 (Clock_10Hz)	**5 Hz clock**	%M500.1 (Clock_5Hz)
2.5 Hz clock	%M500.2 (Clock_2.5Hz)	**2 Hz clock**	%M500.3 (Clock_2Hz)
1.25 Hz clock	%M500.4 (Clock_1.25Hz)	**1 Hz clock**	%M500.5 (Clock_1Hz)
0.625 Hz clock	%M500.6 (Clock_0.625Hz)	**0.5 Hz clock**	%M500.7 (Clock_0.5Hz)
Web server\General			
Activate web server on this module	True	**Permit access only with HTTPS**	False
Web server\Automatic update			
Enable automatic update	True	**Update interval**	10s

Web server\User interface languages	
Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Web server\User management	
User name	**User rights**
Everybody	Query diagnostics ,Read tags ,Write tags ,Read tag status ,Write tag status ,Open user-defined pages ,Write in user-defined web pages ,Read files ,Write/delete files ,Change operating mode ,Let LED flash ,Perform firmware update

Web server\User-defined web pages					
Application name	**HTML source path**	**Default HTML page**	**Files with dynamic content**	**Web DB number**	**Fragment DB number**
	H:\Automation\Webserver Pages	PLC_105.html	.htm;.html	333	334

User interface languages	
Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Time of day\Local time			
Time zone	(UTC +01:00) Berlin, Bern, Brussels, Rome, Stockholm, Vienna		

Time of day\Daylight saving time			
Activate daylight saving time	1	**Difference between standard and daylight saving time**	60mins

Time of day\Daylight saving time\Start of daylight saving time			
Starting week of the month:	Last		Sunday
of	March	**at**	01:00 a.m.

Time of day\Daylight saving time\Start of standard time			
	Last		Sunday
of	October	**at**	02:00 a.m.

Protection & Security	
Level of protection	No protection

Protection & Security\Connection mechanisms	
Permit access with PUT/GET communication from remote partner	True

Overview of addresses\Overview of addresses\Overview of addresses			
Inputs	True	**Outputs**	True
Address gaps	False	**Slot**	True

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
I	0	0	DI 8/DQ 6_1	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	1 Bytes	-	0	1 1
O	0	0	DI 8/DQ 6_1	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	1 Bytes	-	0	1 1
I	1004	1007	HSC_2	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 17
I	1008	1011	HSC_3	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 18
I	64	67	AI 2_1	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 2
I	1020	1023	HSC_6	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 21
O	1004	1005	Pulse_3	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	2 Bytes	-	0	1 34
I	1012	1015	HSC_4	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 19
I	1000	1003	HSC_1	Automatic update	PLC 105 Water Re-circulation System [CPU	-	4 Bytes	-	0	1 16

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
					1212C AC/DC/Rly]					
O	1006	1007	Pulse_4	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	2 Bytes	-	0	1 35
O	1002	1003	Pulse_2	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	2 Bytes	-	0	1 33
I	1016	1019	HSC_5	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 20
I	8	39	SM 1278_1	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	32 Bytes	-	0	2
O	8	39	SM 1278_1	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	32 Bytes	-	0	2
O	4	4	DQ 4x5VDC_1	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	1 Bytes	-	0	1 3
O	1000	1001	Pulse_1	Automatic update	PLC 105 Water Re-circulation System [CPU 1212C AC/DC/Rly]	-	2 Bytes	-	0	1 32

DQ 4x5VDC_1			
General\Project information			
Name	DQ 4x5VDC_1	**Comment**	
General\Catalog information			
Short designation	DQ4 signal board (200 kHz)	**Description**	Signal board DQ4 x 24VDC / 200 kHz; plug-in terminal blocks
Article number	6ES7 222-1BD30-0XB0	**Firmware version**	V1.0
Digital outputs			
Reaction to CPU STOP	Use substitute value		

Digital outputs\Channel0			
Channel address	Q4.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
Digital outputs\Channel1			
Channel address	Q4.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
Digital outputs\Channel2			
Channel address	Q4.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
Digital outputs\Channel3			
Channel address	Q4.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
I/O addresses\Output addresses			
Start address	4.0	**End address**	4.7
Organization block	0	**Process image**	0

SM 1278_1			
General\Project information			
Name	SM 1278_1	**Author**	RobertDa
Comment		**Slot**	2
General\Catalog information			
Short designation	SM 1278, 4 X IO-LINK MASTER	**Description**	4-channel serial interface module for connection of IO link devices.
Article number	6ES7 278-4BD32-0XB0	**Firmware version**	V2.1
Parameter\Diagnostics			
Port 1	Deactivated	**Port 2**	Deactivated
Port 3	Deactivated	**Port 4**	Deactivated
Parameter\Diagnostics\No supply voltage L+			
No supply voltage L+	False		
Parameter\I/O addresses			
Input/output type	Input/output		
Parameter\I/O addresses\ \Input addresses			
Start address	8	**Length**	32
End address	39	**Organization block**	0
Process image	0		
Parameter\I/O addresses\ \Output addresses			
Start address	8	**Length**	32
End address	39	**Organization block**	0
Process image	0		
Parameter\Configuration			
Input/output type	Input/output	**Configuration without S7-PCT**	False
Port Qualifier Information (PQI)	False		
IO link master\Port 1\Port configuration			
Operating mode		**Input data length (without PQI)**	
Output data length		**Vendor ID**	
Device ID		**Inspection / backup level**	
IO link master\Port 1\Input addresses			
Start address		**End address**	
PQI address			
IO link master\Port 1\Output addresses			
Start address		**End address**	

IO link master\Port 2\Port configuration			
Operating mode		**Input data length (without PQI)**	
Output data length		**Vendor ID**	
Device ID		**Inspection / backup level**	
IO link master\Port 2\Input addresses			
Start address		**End address**	
PQI address			
IO link master\Port 2\Output addresses			
Start address		**End address**	
IO link master\Port 3\Port configuration			
Operating mode		**Input data length (without PQI)**	
Output data length		**Vendor ID**	
Device ID		**Inspection / backup level**	
IO link master\Port 3\Input addresses			
Start address		**End address**	
PQI address			
IO link master\Port 3\Output addresses			
Start address		**End address**	
IO link master\Port 4\Port configuration			
Operating mode		**Input data length (without PQI)**	
Output data length		**Vendor ID**	
Device ID		**Inspection / backup level**	
IO link master\Port 4\Input addresses			
Start address		**End address**	
PQI address			
IO link master\Port 4\Output addresses			
Start address		**End address**	
Input/output type	Input/output		
\\Input addresses			
Start address	8	**Length**	32
End address	39	**Organization block**	0
Process image	0		
\\Output addresses			
Start address	8	**Length**	32
End address	39	**Organization block**	0
Process image	0		

CIM Complete System with Simulation Inputs_V16 / Devices & networks

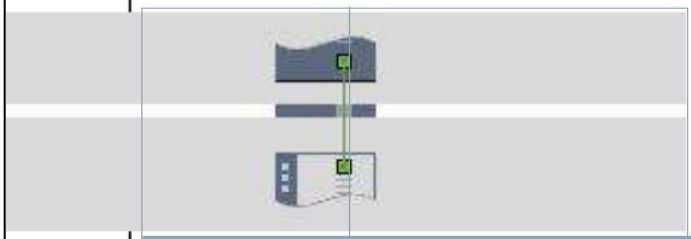
S7-1200 station_6

PLC 106 Linear Drive			
General\Project information			
Name	PLC 106 Linear Drive	**Author**	DH127638
Comment		**Slot**	1
Rack	0		
General\Catalog information			
Short designation	CPU 1212C AC/DC/Rly	**Description**	Work memory 50 KB; 120/240VAC power supply with DI8 x 24VDC SINK/SOURCE, DQ6 x relay and AI2 on board; 4 high-speed counters (expandable with digital signal board) and 4 pulse outputs on board; signal board expands on-board I/O; up to 3 communication modules for serial communication; up to 2 signal modules for I/O expansion; PROFINET interface for programming, HMI and PLC-to-PLC communication
Article number	6ES7 212-1BE40-0XB0	**Firmware version**	V4.0
General\Identification & Maintenance			
Plant designation		**Location identifier**	
Installation date	2019-12-19 15:28:39.681	**Additional information**	
Connection resources			
PG communication:	1	**OP communication:**	1
S7 basic communication:	0	**S7 communication:**	1
Maximum number of S7 connection resources:	38		
PROFINET interface [X1]\General			
Name	PROFINET interface_1	**Author**	DH127638
Comment			
PROFINET interface [X1]\General\Project information			
Name	DI 8/DQ 6_1	**Comment**	
Name	AI 2_1	**Comment**	
PROFINET interface [X1]\Ethernet addresses\Interface networked with			
Subnet:	PN/IE_1		
PROFINET interface [X1]\Ethernet addresses\IP protocol			
IP configuration	Set IP address in the project	**IP address:**	10.13.90.106
Subnet mask:	255.0.0.0	**Use router**	False
PROFINET interface [X1]\Ethernet addresses\PROFINET			
PROFINET device name is set directly at the device	False	**Generate PROFINET device name automatically**	True
PROFINET device name:	plc 106 linear drive	**Converted name:**	plcxa106xalinearxadrivece05
Device number:	0		
PROFINET interface [X1]\Time synchronization			
Enable time synchronization via NTP server	Enable time synchronization via NTP server		IP addresses
Server 1	0.0.0.0	**Server 2**	0.0.0.0
Server 3	0.0.0.0	**Server 4**	0.0.0.0
Update interval	10sec		

PROFINET interface [X1]\Digital inputs\Channel0			
Channel address	I0.0	**Input filters**	0.1 microsec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49152
Event name:	0	**Hardware interrupt:**	0
Rising edge0	Rising edge0		
PROFINET interface [X1]\Digital inputs\Channel0			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49280
Event name:	0	**Hardware interrupt:**	0
Falling edge0	Falling edge0		
PROFINET interface [X1]\Digital inputs\Channel1			
Channel address	I0.1	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49153
Event name:	0	**Hardware interrupt:**	0
Rising edge1	Rising edge1		
PROFINET interface [X1]\Digital inputs\Channel1			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49281
Event name:	0	**Hardware interrupt:**	0
Falling edge1	Falling edge1		
PROFINET interface [X1]\Digital inputs\Channel2			
Channel address	I0.2	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49154
Event name:	0	**Hardware interrupt:**	0
Rising edge2	Rising edge2		
PROFINET interface [X1]\Digital inputs\Channel2			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49282
Event name:	0	**Hardware interrupt:**	0
Falling edge2	Falling edge2		
PROFINET interface [X1]\Digital inputs\Channel3			
Channel address	I0.3	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49155
Event name:	0	**Hardware interrupt:**	0
Rising edge3	Rising edge3		
PROFINET interface [X1]\Digital inputs\Channel3			
Enable falling edge detection	0	**RidPrefixFallingEdgeEvent**	49283
Event name:	0	**Hardware interrupt:**	0
Falling edge3	Falling edge3		
PROFINET interface [X1]\Digital inputs\Channel4			
Channel address	I0.4	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable rising edge detection	0	**RidPrefixRisingEdgeEvent**	49156
Event name:	0	**Hardware interrupt:**	0

Rising edge4	Rising edge4		
PROFINET interface [X1]\Digital inputs\Channel4			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49284
Event name:	0	**Hardware interrupt:**	0
Falling edge4	Falling edge4		
PROFINET interface [X1]\Digital inputs\Channel5			
Channel address	I0.5	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49157
Event name:	0	**Hardware interrupt:**	0
Rising edge5	Rising edge5		
PROFINET interface [X1]\Digital inputs\Channel5			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49285
Event name:	0	**Hardware interrupt:**	0
Falling edge5	Falling edge5		
PROFINET interface [X1]\Digital inputs\Channel6			
Channel address	I0.6	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49158
Event name:	0	**Hardware interrupt:**	0
Rising edge6	Rising edge6		
PROFINET interface [X1]\Digital inputs\Channel6			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49286
Event name:	0	**Hardware interrupt:**	0
Falling edge6	Falling edge6		
PROFINET interface [X1]\Digital inputs\Channel7			
Channel address	I0.7	**Input filters**	6.4 millisec
Enable pulse catch	0		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable rising edge de-tection	0	**RidPrefixRisingEdgeE-vent**	49159
Event name:	0	**Hardware interrupt:**	0
Rising edge7	Rising edge7		
PROFINET interface [X1]\Digital inputs\Channel7			
Enable falling edge detection	0	**RidPrefixFallingEdg-eEvent**	49287
Event name:	0	**Hardware interrupt:**	0
Falling edge7	Falling edge7		
PROFINET interface [X1]\Analog inputs\Noise reduction			
Integration time	50 Hz (20 ms)		
PROFINET interface [X1]\Analog inputs\Channel0			
Channel address	IW64	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diag-nostics	1
PROFINET interface [X1]\Analog inputs\Channel1			
Channel address	IW66	**Measurement type**	Voltage
Voltage range	0..10 V	**Smoothing**	Weak (4 cycles)
		Enable overflow diag-nostics	1
PROFINET interface [X1]\Digital outputs			
Reaction to CPU STOP	Use substitute value		

PROFINET interface [X1]\Digital outputs\Channel0			
Channel address	Q0.0	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel1			
Channel address	Q0.1	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel2			
Channel address	Q0.2	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel3			
Channel address	Q0.3	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel4			
Channel address	Q0.4	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Digital outputs\Channel5			
Channel address	Q0.5	**Substitute a value of 1 on a change from RUN to STOP.**	0
PROFINET interface [X1]\Operating mode			
IO controller	True	**IO system**	
Device number	0	**IO device**	False
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	0.0	**End address**	0.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Input addresses			
Start address	64	**End address**	67
Organization block	0	**Process image**	0
PROFINET interface [X1]\I/O addresses\Output addresses			
Start address	0.0	**End address**	0.7
Organization block	0	**Process image**	0
PROFINET interface [X1]\Advanced options\Interface options			
Support device replacement without exchangeable medium	True	**Use IEC V2.2 LLDP mode**	True
Keep-Alive connection monitoring:	30s		
PROFINET interface [X1]\Advanced options\Real time settings\IO communication			
Send clock:	1.000ms		
PROFINET interface [X1]\Advanced options\Real time settings\Real time options			
Calculated bandwidth for cyclic IO data:	0.000ms	**Calculated bandwidth for cyclic IO data:**	0.000%
PROFINET interface [X1]\Advanced options\Port [X1 P1]\General			
Name	Port_1	**Author**	DH127638
Comment			
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Local port:			
Local port:	PLC 106 Linear Drive\PROFINET interface_1 [X1]\Port_1 [X1 P1]	**Medium:**	Copper
Cable name:	---		



PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port interconnection\Partner port:			
	Monitoring of partner port is not possible	**Partner port:**	Any partner
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Activate			
Activate this port for use	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Connection			
Transmission rate / duplex:	Automatic	**Monitor**	False
Enable autonegotiation	True		
PROFINET interface [X1]\Advanced options\Port [X1 P1]\Port options\Boundaries			
End of detection of accessible devices	False	**End of topology discovery**	False
End of the sync domain	False		
High speed counters (HSC)\HSC1\General\Enable			
Enable this high speed counter	1	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0
Enable this high speed counter	0	**Enable this high speed counter**	0
High speed counters (HSC)\HSC1\General\Project information			
Name	HSC_1	**Comment**	
Name	HSC_2	**Comment**	
Name	HSC_3	**Comment**	
Name	HSC_4	**Comment**	
Name	HSC_5	**Comment**	
Name	HSC_6	**Comment**	
High speed counters (HSC)\HSC1\Function			
Type of counting	Count	**Operating phase**	Single phase
		Counting direction is specified by	User program (internal direction control)
Initial counting direction	Count up		
Frequency measuring period	-/-sec		
High speed counters (HSC)\HSC1\Reset to initial values\Initial values			
Initial counter value	0	**Initial reference value**	0
High speed counters (HSC)\HSC1\Reset to initial values\Sync options			
Use external sync input	0	**Signal level of the sync input**	-/-
High speed counters (HSC)\HSC1\Event configuration			
Generate interrupt for counter value equals reference value event.	0		
High speed counters (HSC)\HSC1\Event configuration			
Generate interrupt for sync event.	0		

High speed counters (HSC)\HSC1\Event configuration			
Generate interrupt for change of direction event.	0		
High speed counters (HSC)\HSC1\Hardware inputs			
Clock generator input	%I0.0	**Direction input**	---
Sync input	---		
High speed counters (HSC)\HSC1\I/O addresses\Input addresses			
Start address	1004.0	**End address**	1007.7
Start address	1008.0	**End address**	1011.7
Organization block	0	**Start address**	1012.0
End address	1015.7	**Organization block**	0
Process image	0	**Start address**	1000.0
End address	1003.7	**Organization block**	0
Process image	0	**Start address**	1020.0
End address	1023.7	**Organization block**	0
Process image	0	**Organization block**	0
Process image	0	**Process image**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Enable			
Enable this pulse generator	0	**Enable this pulse generator**	0
Pulse generators (PTO/PWM)\PTO1/PWM1\General\Project information			
Name	Pulse_1	**Comment**	
Name	Pulse_2	**Comment**	
Pulse generators (PTO/PWM)\PTO1/PWM1\I/O addresses\Output addresses			
Start address	1000.0	**End address**	1001.7
Start address	1002.0	**End address**	1003.7
Organization block	0	**Organization block**	0
Process image	0	**Process image**	0
Startup			
Startup after POWER ON	Warm restart - mode before POWER OFF	**Comparison preset to actual configuration**	Startup CPU even if mismatch
Configuration time	60000ms	**OBs should be interruptible**	1
Cycle			
Cycle monitoring time	150ms		
Enable minimum cycle time for cyclic OBs	0	**Minimum cycle time**	1ms
Communication load			
Cycle load due to communication	20%		
System and clock memory\System memory bits			
Enable the use of system memory byte	1	**Address of system memory byte (MBx)**	500
First cycle	%M500.0 (FirstScan)	**Diagnostic status changed**	%M500.1 (DiagStatusUpdate)
Always 1 (high)	%M500.2 (AlwaysTRUE)	**Always 0 (low)**	%M500.3 (AlwaysFALSE)
System and clock memory\Clock memory bits			
Enable the use of clock memory byte	1	**Address of clock memory byte (MBx)**	501
10 Hz clock	%M501.0 (Clock_10Hz)	**5 Hz clock**	%M501.1 (Clock_5Hz)
2.5 Hz clock	%M501.2 (Clock_2.5Hz)	**2 Hz clock**	%M501.3 (Clock_2Hz)
1.25 Hz clock	%M501.4 (Clock_1.25Hz)	**1 Hz clock**	%M501.5 (Clock_1Hz)
0.625 Hz clock	%M501.6 (Clock_0.625Hz)	**0.5 Hz clock**	%M501.7 (Clock_0.5Hz)
Web server\General			
Activate web server on this module	False	**Permit access only with HTTPS**	True

Web server\Automatic update			
Enable automatic update	True	**Update interval**	0s

Web server\User interface languages	
Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Web server\User management	
User name	**User rights**
Everybody	

Web server\User-defined web pages					
Application name	**HTML source path**	**Default HTML page**	**Files with dynamic content**	**Web DB number**	**Fragment DB number**
		index.htm	.htm;.html	333	334

User interface languages	
Assign project language	**User interface languages**
English (United States)	German
English (United States)	English
English (United States)	French
English (United States)	Spanish
English (United States)	Italian
English (United States)	Chinese (simplified)

Time of day\Local time			
Time zone	(UTC +01:00) Berlin, Bern, Brussels, Rome, Stockholm, Vienna		

Time of day\Daylight saving time			
Activate daylight saving time	1	**Difference between standard and daylight saving time**	60mins

Time of day\Daylight saving time\Start of daylight saving time			
Starting week of the month:	Last		Sunday
of	March	**at**	01:00 a.m.

Time of day\Daylight saving time\Start of standard time			
	Last		Sunday
of	October	**at**	02:00 a.m.

Protection & Security	
Level of protection	No protection

Protection & Security\Connection mechanisms	
Permit access with PUT/GET communication from remote partner	False

Overview of addresses\Overview of addresses\Overview of addresses			
Inputs	True	**Outputs**	True
Address gaps	False	**Slot**	True

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
I	0	0	DI 8/DQ 6_1	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	1 Bytes	-	0	1 1
O	0	0	DI 8/DQ 6_1	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	1 Bytes	-	0	1 1
I	64	67	AI 2_1	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 2
I	1000	1003	HSC_1	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 16
I	1004	1007	HSC_2	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 17
I	1008	1011	HSC_3	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 18
I	1012	1015	HSC_4	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 19
I	1016	1019	HSC_5	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 20
I	1020	1023	HSC_6	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	4 Bytes	-	0	1 21
O	1000	1001	Pulse_1	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	2 Bytes	-	0	1 32
O	1002	1003	Pulse_2	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	2 Bytes	-	0	1 33
O	1004	1005	Pulse_3	Automatic update	PLC 106 Linear Drive [CPU 1212C AC/DC/Rly]	-	2 Bytes	-	0	1 34
O	1006	1007	Pulse_4	Automatic update	PLC 106 Linear	-	2 Bytes	-	0	1 35

Type	Addr. from	Addr. to	Module	PIP	Device name	Device number	Size	Master / IO system	Rack	Slot
					Drive [CPU 1212C AC/DC/Rly]					

CM 1241 (RS232)_1			
General\Project information			
Name	CM 1241 (RS232)_1	**Author**	RobertDa
Comment		**Slot**	101
General\Catalog information			
Short designation	CM 1241 (RS232)	**Description**	Communications module with RS232 interface; 9-pin D-sub male connector
Article number	6ES7 241-1AH32-0XB0	**Firmware version**	V2.1
RS-232 interface\General\Project information			
Name	RS-232 interface	**Comment**	
RS-232 interface\IO-Link			
Baud rate	9.6 kbps	**Parity**	No parity
Data bits	8 bits per character	**Stop bits**	1
Flow control	None	**XON character (HEX)**	0
(ASCII)	NUL	**XOFF character (HEX)**	0
(ASCII)	NUL	**Wait time**	20000ms
RS-232 interface\Configuration of transmitted message\Transmission options			
RTS ON delay	0ms	**RTS OFF delay**	0ms
Send break at message start	0	**Number of bit times in a break**	0Bit times
Send idle line after a break	0	**Idle line after a break**	40Bit times
RS-232 interface\Configuration of received message\Message start			
Define message start conditions	Start on any character	**Recognize message start with broken line**	0
Recognize message start with idle line	0	**Idle line time**	0Bit times
Recognize message start with single character	0	**Message start character (HEX)**	0
Message start character (ASCII)	NUL	**Recognize message start with a character sequence**	0
Number of strings to define	1		
RS-232 interface\Configuration of received message\Message start\5-character message start sequence\Message start sequence 1			
Check character 1	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 2	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 3	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 4	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 5	0	**Character value (HEX):**	0

Character value (ASCII):	ANY		
RS-232 interface\Configuration of received message\Message start\5-character message start sequence\Message start sequence 2			
Check character 1	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 2	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 3	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 4	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 5	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
RS-232 interface\Configuration of received message\Message start\5-character message start sequence\Message start sequence 3			
Check character 1	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 2	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 3	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 4	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 5	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
RS-232 interface\Configuration of received message\Message start\5-character message start sequence\Message start sequence 4			
Check character 1	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 2	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 3	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
Check character 4	0	**Character value (HEX):**	0

Character value (ASCII):	ANY		
Check character 5	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
RS-232 interface\Configuration of received message\Message end\Define message end conditions			
Recognize message end by message time-out	1	**Message timeout**	200ms
Recognize message end by response time-out	0	**Response timeout**	200ms
Recognize message end by inter-character timeout	0	**Inter-character gap timeout**	48Bit times
Recognize message end by maximum length	0	**Maximum length of message**	1bytes
Detect message end by fixed message length	0	**Fixed message length**	1bytes
Read message length from message	0	**Offset of length field in message**	0bytes
Size of length field	1bytes	**The length field following the data is not included in the message length**	0bytes
Recognize message end with a character sequence	0		
RS-232 interface\Configuration of received message\Message end\5-character message end sequence			
Check character 1	0	**Character value (HEX):**	0
Character value (ASCII):	ANY	**Check character 2**	0
Character value (HEX):	0	**Character value (ASCII):**	ANY
Check character 3	0	**Character value (HEX):**	0
Character value (ASCII):	ANY	**Check character 4**	0
Character value (HEX):	0	**Character value (ASCII):**	ANY
Check character 5	0	**Character value (HEX):**	0
Character value (ASCII):	ANY		
RS-232 interface\Configuration of received message\Message end\Receive buffer			
Received frames in buffer:	20	**Prevent overwriting**	1
Clear receive buffer on startup	1		

CIM Complete System with Simulation Inputs_V16 / Devices & networks

PN/IE_1

PN/IE_1			
General			
Name:	PN/IE_1	**S7 subnet ID:**	7357 - 1
Connect devices that are not linked with this subnet in case of port connection.	True	**Check IP address for uniqueness**	True

Domain management\Sync domains

Domain name	Default domain
Sync-Domain_1	True

Domain management\Sync domains\Sync-Domain_1

Sync domain:	Sync-Domain_1	**Converted name:**	sync-domainxb19998
Send clock		**Default domain**	True
Make 'high performance' possible	False	**Bandwidth use**	Maximum 50% cyclic IO data. Balanced proportion.

Domain management\Sync domains\Sync-Domain_1\Devices\IO system

IO system	Sync master
PLC 101 Master - 0.PROFINET interface_1	
PLC 102 Pneumatic Station - 2.PROFINET interface_1	
PLC 103 Process Station - 4.PROFINET interface_1	
PLC 104 Hydraulic Station - 5.PROFINET interface_1	
PLC 105 Water Recirculation System.PROFINET interface_1	
PLC 106 Linear Drive.PROFINET interface_1	

Domain management\Sync domains\Sync-Domain_1\Devices\IO devices\PLC 101 Master - 0.PROFINET interface_1

PROFINET device name	RT class	Synchronization role	Redundancy level	DFP group
plc 101 master - 0	RT	Unsynchronized		

Domain management\Sync domains\Sync-Domain_1\Devices\IO devices\PLC 102 Pneumatic Station - 2.PROFINET interface_1

PROFINET device name	RT class	Synchronization role	Redundancy level	DFP group
plc 102 pneumatic station - 2	RT	Unsynchronized		

Domain management\Sync domains\Sync-Domain_1\Devices\IO devices\PLC 103 Process Station - 4.PROFINET interface_1

PROFINET device name	RT class	Synchronization role	Redundancy level	DFP group
plc 103 process station - 4	RT	Unsynchronized		

Domain management\Sync domains\Sync-Domain_1\Devices\IO devices\PLC 104 Hydraulic Station - 5.PROFINET interface_1

PROFINET device name	RT class	Synchronization role	Redundancy level	DFP group
plc 104 hydraulic station - 5	RT	Unsynchronized		

Domain management\Sync domains\Sync-Domain_1\Devices\IO devices\PLC 105 Water Recirculation System.PROFINET interface_1

PROFINET device name	RT class	Synchronization role	Redundancy level	DFP group
plc 105 water recirculation system	RT	Unsynchronized		

Domain management\Sync domains\Sync-Domain_1\Devices\IO devices\PLC 106 Linear Drive.PROFINET interface_1

PROFINET device name	RT class	Synchronization role	Redundancy level	DFP group
plc 106 linear drive	RT	Unsynchronized		

Domain management\MRP domains

Domain name	Default domain
mrpdomain-1	True

Domain management\MRP domains\mrpdomain-1			
Media redundancy domain:	mrpdomain-1	**Converted name:**	mrpdomain-1
Interfaces within the ring:	0	**Interfaces outside the ring:**	11
Number of 'Manager (auto)':	0	**Number of managers:**	0
Number of clients:	0	**Default domain**	True
Redundancy manager outside of the project	False		

Domain management\MRP domains\mrpdomain-1\Devices\Display
IO system
PLC 101 Master - 0.PROFINET interface_1
PLC 102 Pneumatic Station - 2.PROFINET interface_1
PLC 103 Process Station - 4.PROFINET interface_1
PLC 104 Hydraulic Station - 5.PROFINET interface_1
PLC 105 Water Recirculation System.PROFINET interface_1
PLC 106 Linear Drive.PROFINET interface_1

Domain management\MRP domains\mrpdomain-1\Devices\IO devices\PLC 101 Master - 0.PROFINET interface_1				
PROFINET device name	**MRP domain**	**MRP role**	**Ring port 1**	**Ring port 2**
plc 101 master - 0	mrpdomain-1	NotInRing		

Domain management\MRP domains\mrpdomain-1\Devices\IO devices\PLC 102 Pneumatic Station - 2.PROFINET interface_1				
PROFINET device name	**MRP domain**	**MRP role**	**Ring port 1**	**Ring port 2**
plc 102 pneumatic station - 2	mrpdomain-1	NotInRing		

Domain management\MRP domains\mrpdomain-1\Devices\IO devices\PLC 103 Process Station - 4.PROFINET interface_1				
PROFINET device name	**MRP domain**	**MRP role**	**Ring port 1**	**Ring port 2**
plc 103 process station - 4	mrpdomain-1	NotInRing		

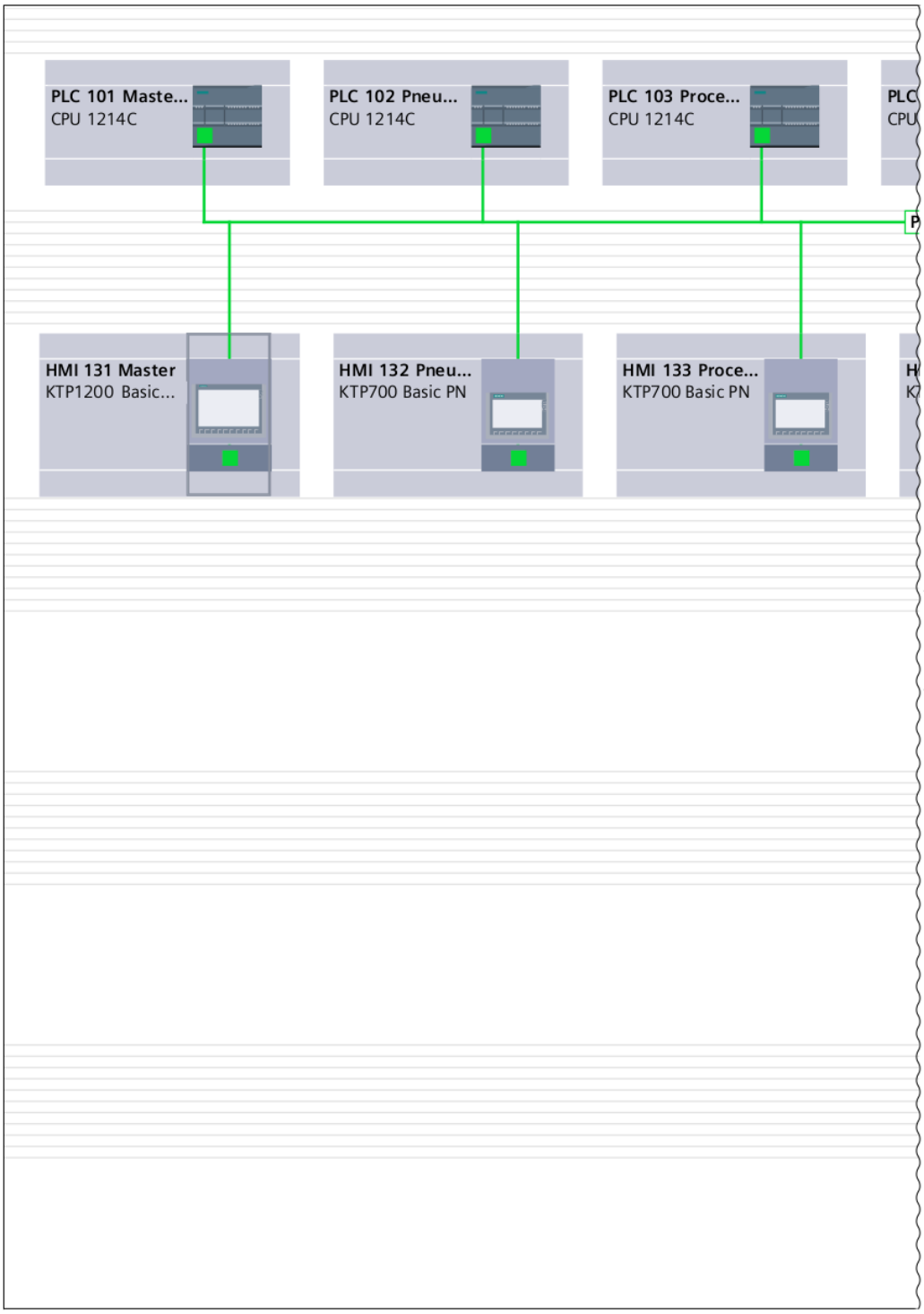
Domain management\MRP domains\mrpdomain-1\Devices\IO devices\PLC 104 Hydraulic Station - 5.PROFINET interface_1				
PROFINET device name	**MRP domain**	**MRP role**	**Ring port 1**	**Ring port 2**
plc 104 hydraulic station - 5	mrpdomain-1	NotInRing		

Domain management\MRP domains\mrpdomain-1\Devices\IO devices\PLC 105 Water Recirculation System.PROFINET interface_1				
PROFINET device name	**MRP domain**	**MRP role**	**Ring port 1**	**Ring port 2**
plc 105 water recirculation system	mrpdomain-1	NotInRing		

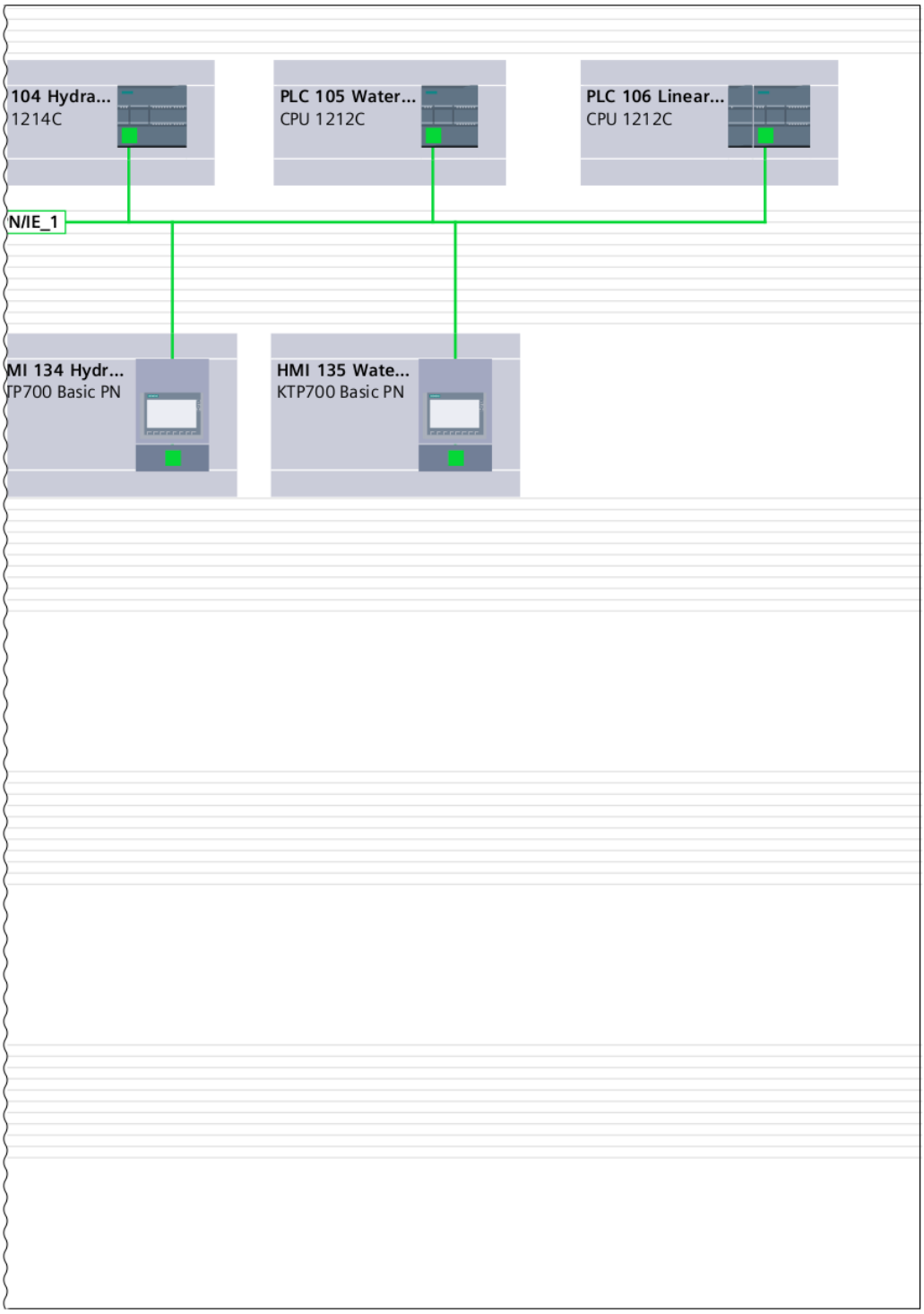
Domain management\MRP domains\mrpdomain-1\Devices\IO devices\PLC 106 Linear Drive.PROFINET interface_1				
PROFINET device name	**MRP domain**	**MRP role**	**Ring port 1**	**Ring port 2**
plc 106 linear drive	mrpdomain-1	NotInRing		

CIM Complete System with Simulation Inputs_V16 / Devices & networks

Network view (1.1 / 1.2)



Network view (1.2 / 1.2)



1.1 (Page13 - 2)

1910603

GRADEMARK REPORT

FINAL GRADE

69/100

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

QM

Good Structure

Report is structured exactly as stated in the assignment brief.

PAGE 3

PAGE 4

QM

Awk.

Awkward:
The expression or construction is cumbersome or difficult to read. Consider rewriting.

PAGE 5

Text Comment. This is an excellent overview of Industry 4.0 and M2M systems

PAGE 6

QM

Grocer's apostrophe

If you meant this as a plural word, don't use an apostrophe. This also applies to acronyms and initialisms such as PLCs

PAGE 7

Text Comment. Incorrect, this is the hydraulic station PLC, read the label etched just below the PLC 104, see figure 8

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13

PAGE 14

PAGE 15

QM

Spelling

Spelling error

PAGE 16

Text Comment. some are words and some are reals

PAGE 17

Text Comment. too small to read

PAGE 18

PAGE 19

PAGE 20

PAGE 21

PAGE 22

PAGE 23

PAGE 24

PAGE 25

Text Comment. There was time available

Text Comment. Did this prevent the conveyor from moving?

PAGE 26

PAGE 27

PAGE 28

QM

Wide Range of Sources

You have shown good evidence of reading from a wide range of sources.

QM

Correct method of listing.

You have listed your sources correctly according to the Harvard method.

PAGE 29

PAGE 30

PAGE 31

Text Comment. The inclusion of a program printout produces a very high plagiarism score and is to be avoided

PAGE 32

PAGE 33

PAGE 34

PAGE 35

PAGE 36

PAGE 37

PAGE 38

PAGE 39

PAGE 40

PAGE 41

PAGE 42

PAGE 43

PAGE 44

PAGE 45

PAGE 46

PAGE 47

PAGE 48

PAGE 49

PAGE 50

PAGE 51

PAGE 52

PAGE 53

PAGE 54

PAGE 55

PAGE 56

PAGE 57

PAGE 58

PAGE 59

PAGE 60

PAGE 61

PAGE 62

PAGE 63

PAGE 64

PAGE 65

PAGE 66

PAGE 67

PAGE 68

PAGE 69

PAGE 70

PAGE 71

PAGE 72

PAGE 73

PAGE 74

PAGE 75

PAGE 76

PAGE 77

PAGE 78

PAGE 79

PAGE 80

PAGE 81

PAGE 82

PAGE 83

PAGE 84

PAGE 85

PAGE 86

PAGE 87

PAGE 88

PAGE 89

PAGE 90

PAGE 91

PAGE 92

PAGE 93

PAGE 94

PAGE 95

PAGE 96

PAGE 97

PAGE 98

PAGE 99

PAGE 100

PAGE 101

PAGE 102

PAGE 103

PAGE 104

PAGE 105

PAGE 106

PAGE 107

PAGE 108

PAGE 109

PAGE 110

PAGE 111

PAGE 112

PAGE 113

PAGE 114

PAGE 115

PAGE 116

PAGE 117

PAGE 118

PAGE 119

PAGE 120

PAGE 121

PAGE 122

PAGE 123

PAGE 124

PAGE 125

GRADING FORM: NEW CSG-RUBRIC

BENJAMIN BRICKLE

69

1. ENGAGEMENT WITH LITERATURE

Engagement with an extensive range of relevant and credible literature. Consistently accurate application of referencing. (16/20)

16

2. KNOWLEDGE AND UNDERSTANDING

Competent knowledge of the basic underlying concepts and principles. Exhibits very good understanding. (13/20)

13

3. COGNITIVE AND INTELLECTUAL

Sound evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data accurately. Ability to devise arguments using evidence to make mostly appropriate and valid judgements. (13/20)

13

4. PRACTICAL APPLICATION

An advanced application of a range of taught, basic methods, materials, tools and/or techniques. The context of the application is well considered, and insightful. Excellent evidence of different approaches to problem-solving in particular contexts and proposes appropriate solutions. (14/20)

14

5. TRANSFERABLE SKILLS

Work is accurate, coherent, fluent, well-structured and organised. Can work effectively independently and/or as part of a team, with very good contribution to group activities. Demonstrates very good skills for employment requiring the exercise of some personal responsibility, with just occasional minor weakness. (13/20)

13