

SIMATIC S7-1200 G2

Technical Slides



Challenge

Increasing demand for smart automation solutions

The advancement of technology is placing greater pressure on industry and machine building. It is not only high-end applications that are impacted, but there is also a growing demand for cutting-edge technology to enhance productivity in simpler automation solutions. This requires a well-coordinated automation system that minimizes complexity and is optimized for cost efficiency over the entire life cycle.

Challenges and opportunities



Productivity

Technological advancements require constant improvements and state-of-the-art technology

Flexibility

Versatile customer requirements demand scalable and flexible automation solutions

Cost-optimization

Legal regulations (such as machine safety) must be met without driving up costs or compromising productivity

SIMATIC S7-1200 G2

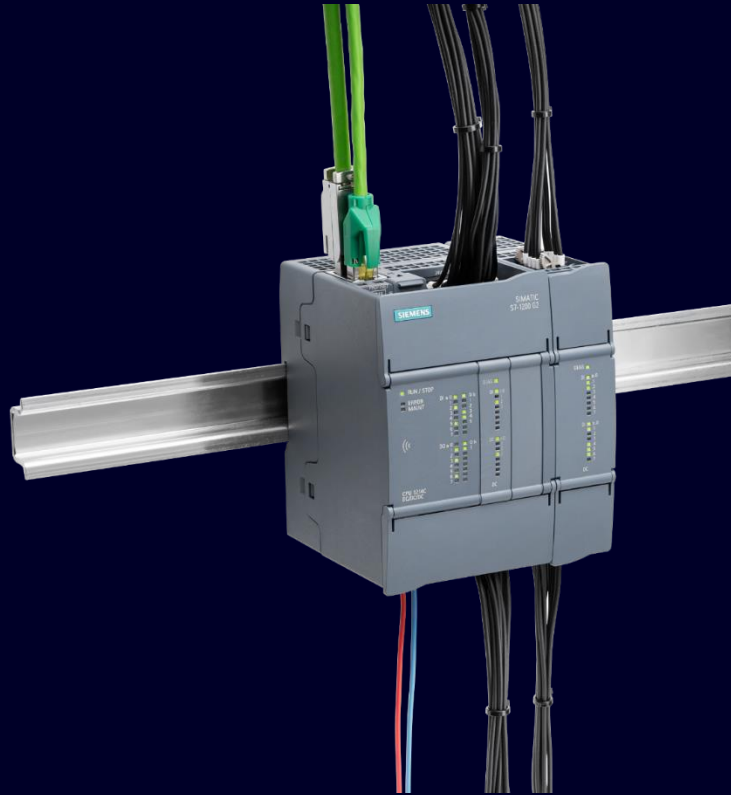
New standards in the field of basic automation controllers

Easier fail-safe accessibility

Flexible expansion of fail-safe I/Os according to the required number of safety functions and safety modes with an optimized fail-safe hardware portfolio (e.g., fail-safe signal boards).

More competitive solutions with increased flexibility and scalability

Flexible adaptation to a wide range of customer requirements thanks to an optimized hardware portfolio and seamless scalability across the SIMATIC controller portfolio.



Higher performance and enhanced connectivity

New level of productivity with improved processing power and dedicated communication performance, as well as NFC- functionality with wireless access to diagnostic, operational and device data.

Integrated motion control

SIMATIC S7-1200 G2 controllers enable the control of single axes, coordinated axes and simple kinematics. The configuration of motion control functions is very simple on the basis of integrated technology objects.

Market Entry together with TIA Portal V20

Overview

SIMATIC S7-1200 G2 configured in the TIA Portal fits perfectly

Modular space-saving controller for automation systems requiring simple or extended functionality in the area of logic, HMI and networking.

- Perfect for stand-alone and interconnected machines as well as cost-effective automation solutions
- Enabling more flexible, scalable, and higher-performance motion control demands
- Increasing operational performance and reliability with smart automation solutions and fail-safe integration
- Simple integration into interconnected systems and into systems that require one or more HMI devices
- Extended functionality for small motion control systems and small process applications
- Two communication ports on each CPU

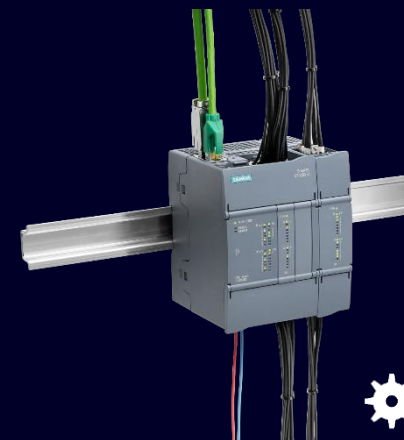
Controller, HMI and Networking

Everything developed in one software architecture



Overview

Higher competence



New Design

- HW: ~25% space reduction
- Fail-safe integrated
- Memory expansion

Fail-safe

- Integrated in the complete range
- Improved F-I/O Portfolio
- Integrated in STEP 7 Basic

Enhanced Connectivity

- PROFINET: 31 devices with IRT
- 8 High-Speed-Counter
- Near Field Communication (NFC) and App

Integrated Motion Control

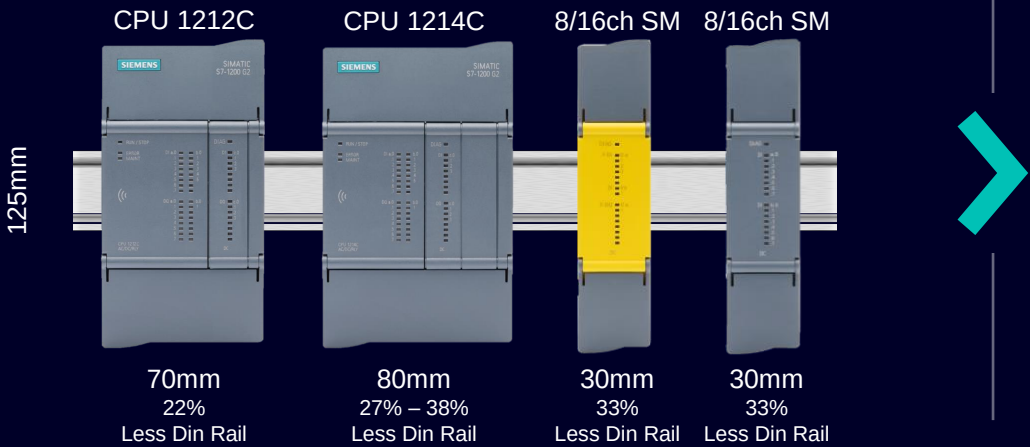
Kinematics, Multi Axis Control, and Single Axis Control

i Scalable, powerful portfolio for the basic automation segment

Overview

Higher competence

New HW design



Enhanced performance and communication

- Enhanced processing power, dedicated communication performance and more memory
- Up to 31 PROFINET devices and deterministic program execution with PROFINET IRT
- Near Field Communication (NFC) for commissioning and diagnostics support

Easier onboarding entry for fail-safe products

- Fail-safe integrated in the complete range (PROFIsafe communication, I/Os)
- Improved F-I/O portfolio (fail-safe signal boards, fail-safe signal modules with mixed I/Os)
- Fail-safe & Motion Engineering integrated in TIA Portal Basic

Integrated motion control

- Kinematics
- Multi Axis control
- Single Axis control

Technology Objects

Expansion

	EM	RAM Data	RAM Progr.
CPU 1212C	6 in total	500 k	150 k
CPU 1212FC	therein 3 cm	500 k	200 k
CPU 1214C	10 in total	750 k	250 k
CPU 1214FC	therein 3 cm	750 k	300 k

Overview

CPUs and communication

CPUs

	CPU 1212(F)C	CPU 1214(F)C
W x H x D (mm)	70 x 125 x 100	80 x 125 x 100
Integrated DI/DO	6/8	14/10
PROFINET/Modbus TCP	2 ports	2 ports
Communication Modules	3 max	3 max
Total SMs + CMs	6 max	10 max
Total SBs	1 max	2 max
Integrated Motion Control	✓	✓
NFC	✓	✓
Memory card	Optional	Optional
Power supply voltage/ input type voltage/ output type and power	DC/DC/DC DC/DC/RLY AC/DC/RLY (Std. only)	DC/DC/DC DC/DC/RLY AC/DC/RLY (Std. only)

Communication

CBs

RS485

CMs

PtP (RS232/RS485/RS422)
Additional Modules planned



Overview

Signal boards and signal modules

SBs

Digital SBs

8 DI 24V 100 kHz

8 DQ 24V 100 kHz

4 DI / 4 DQ 24V 100 kHz

4 DI / 4 DQ 5V 200 kHz

Analog SBs

4 AI

4 AQ

2 AI / 2 AQ

4 TC

2 RTD



SMs

Digital SMs

DI 16 x 24 V DC

DQ 16 x 24 V DC 0.5 A

DQ 16 x Relay

8 DI / 8 DQ

8 DI / 8 RLY

Analog SMs

8 AI

8 AQ

4 AI / 4 AQ

8 TC

4 RTD



Overview

Fail-safe: signal boards and signal modules

SBs

4x F-DI(1oo1) / 2x F-DI(1oo2), 4-Vs

2x F-DQ, PP-PM

SMs

8x F-DI(1oo1) / 4x F-DI(1oo2), 8-Vs

4x F-DQ, PP-PM

4x F-DI(1oo1) / 2x F-DI (1oo2),
2x F-DQ, PP-PM, 2x DI

1oo1 (One out of One):

1oo1 as simple redundancy, a single input connected to a fail-safe digital input

1oo2 (One out of Two):

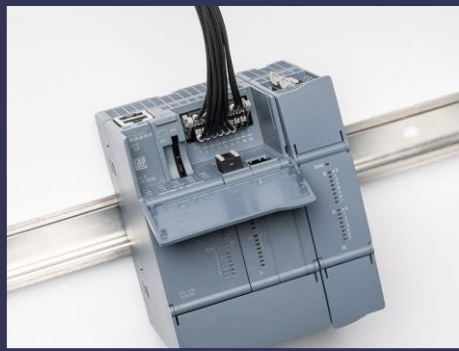
Redundancy with cross-diagnosis: There are two independent sensors, each connected to an F-DI. Both sensors provide signals to the F-DI. The F-DI monitors the signals and makes decisions based on both inputs. This configuration is normally used in safety-critical applications

Vs: Integrated Sensor supply,

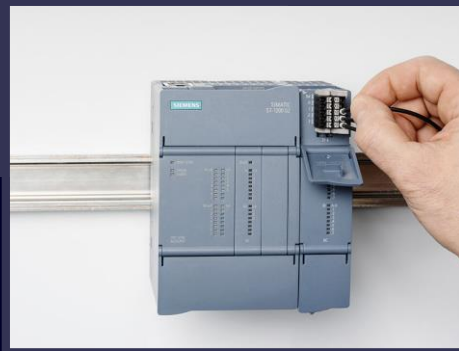
allows to detect short-circuit or overload scenarios, and react accordingly



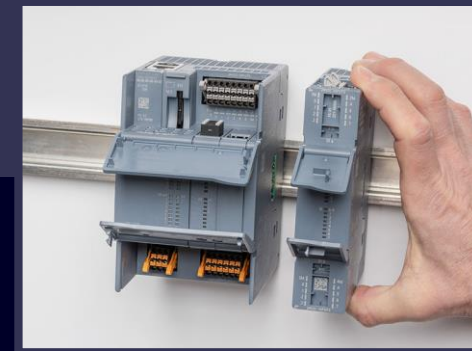
Design and Handling Highlights



Memory Card access, 2xPN Ports and improved signal board concept (up to two SBs).



Removable high(er) density terminal blocks with push-in wiring for ease of use → non-contact pre-wiring position.



DIN rail footprint reduced by ~ 25%. Single, reliable bus connection system for both SMs and CMs.

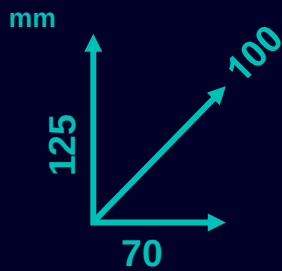
Design and Handling

CPU: Dimensions SIMATIC S7-1200 G2

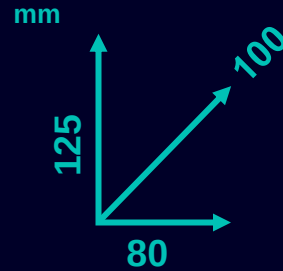


CPU 1212C

CPU 1212(F)C
... DC/DC/DC
... DC/DC/RLY
... AC/DC/RLY



CPU 1214(F)C
... DC/DC/DC
... DC/DC/RLY
... AC/DC/RLY



Fail-safe versions represented in yellow



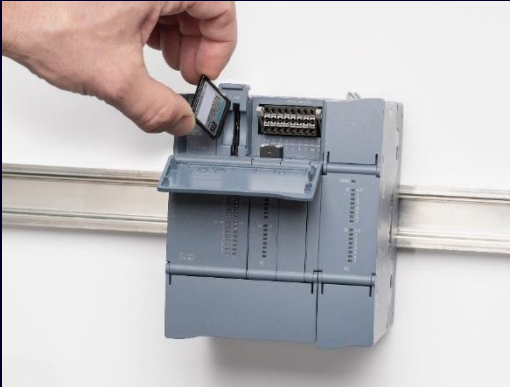
CPU 1214C

Design and Handling

Accessories: SIMATIC Memory Card

Capacity

- 4 MB
- 12 MB
- 24 MB
- 256 MB
- 2 GB
- 32 GB



What can be saved on a S7-1200 memory card?

- Program
- Data
- System data
- Recipes
- Data protocol
- Files
- Projects

SIMATIC memory card optional

SIMATIC Memory Card

- Increased lifespan 500,000 write accesses possible
- Project sent as an e-mail with transfer to memory card using standard PC
- No special card reader required (SD card with FAT 32 file system)
- No data lost despite openness with CPU shutdown
- Increased copy protection – Option of linking the programs to the memory card serial numbers



Efficient Motion Control

Integrated motion control for basic automation machines



SIMATIC Motion Control

Supported Technology Objects (TO)*

- TO_SpeedAxis 
- TO_PositioningAxis 
- TO_SynchronousAxis 
- TO_ExternalEncoder 
- TO_OutputCam 
- TO_CamTrack 
- TO_MeasuringInput 
- TO_Cam 
- TO_Kinematics 

allowing to address complex motion applications

*possibly slightly less features supported compared to SIMATIC S7-1500 T-CPU

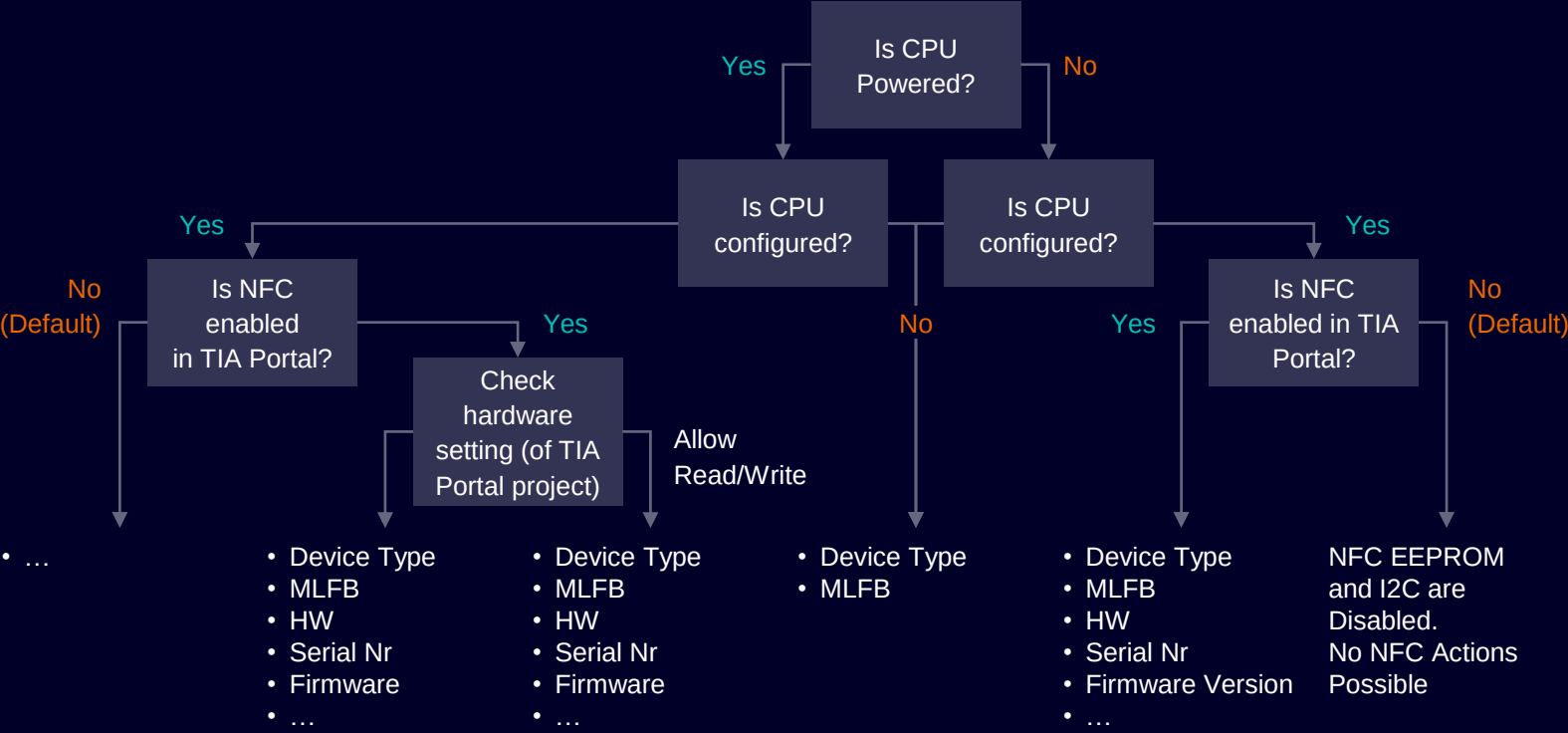
Machine Performance and Reliability

NFC function



Near Field Communication (NFC)

- Gather Information without having to power the Device
- Read/Write Application and Diagnostic Data (based on configuration)



How to migrate technically

CPUs

Modules

Migration Possibility

SIMATIC S7-1200 to SIMATIC S7-1200 G2: CPU 1212

S7-1200

Type of CPU	CPU 1211C	CPU 1212C	CPU 1212FC
Interfaces			
Program memory/ Data memory	75 kB	100 kB	150 kB
Bit performance (ns)	85	85	85
Integrated DI/DO	6/4	8/6	8/6
Integrated AI/AO	2/-	2/-	2/-
HSC	6	6	6
Width (mm)	90	90	90

S7-1200 G2

CPU 1212C	CPU 1212FC
	
150/500 kB	200/500 kB
40	40
8/6	8/6
Optional SB	Optional SB
8	8
70	70



 PROFINET/IE

Migration Possibility

SIMATIC S7-1200 to SIMATIC S7-1200 G2: CPU 1214

S7-1200

Type of CPU	CPU 1214C	CPU 1214FC	CPU 1215C	CPU 1215FC	CPU 1217C
Interfaces					
Program memory/ Data memory	150 kB	200 kB	200 kB	250 kB	250 kB
Bit performance (ns)	85	85	85	85	85
Integrated DI/DO	14/10	14/10	14/10	14/10	14/10
Integrated AI/AO	2/-	2/-	2/2	2/2	2/2
HSC	6	6	6	6	6
Width (mm)	110	110	130	130	150

S7-1200 G2

CPU 1214C	CPU 1214FC
	
250/750 kB	300/750 kB
40	40
14/10	14/10
Optional SB	Optional SB
8	8
80	80



 PROFINET/IE

TIA Portal V20

Engineering for standard and fail-safe S7-1200 G2

Fail-safe SIMATIC S7-1200 (G2): No more separate Safety license from V20 onwards

STEP 7 Safety Basic will be discontinued from V20 onwards

Until TIA Portal V19

Hardware:
S7-1200 F-CPU/F-DI/F-DQ

Software:

- STEP 7 V19 Basic (or Advanced)
- STEP 7 V19 Safety Basic



SIMATIC S7-1200

Starting with TIA Portal V20

Hardware:
S7-1200 (G2) F-CPU/F-DI/F-DQ

Software:
STEP 7 V20 Basic (or Advanced)



SIMATIC S7-1200 G2



Scalable automation solutions

Scalable portfolio for standard and machine safety functions.



Seamless system integration

Seamlessly integrated in STEP 7 without need for separate license.



Reduce license costs

- Reduce entry costs
- Especially customers requiring just few F-PLCs

Hints

- V18/V19 Safety Basic licenses will still be available
- Future S7-1200 (G2) Hardware will use similar principles
- SUS contracts for Safety Basic will be discontinued end of 2024

TIA Portal V20

STEP 7 Basic

Support of SIMATIC S7-1200 (G2) standard and fail-safe hardware

- S7-1200 (G2) Std.- & F-CPU's
- S7-1200 (G2) Std.- & F- I/O
- ET 200SP Std.- & F-I/O



Supports engineering for standard and fail-safe application

SIMATIC
STEP 7 Basic



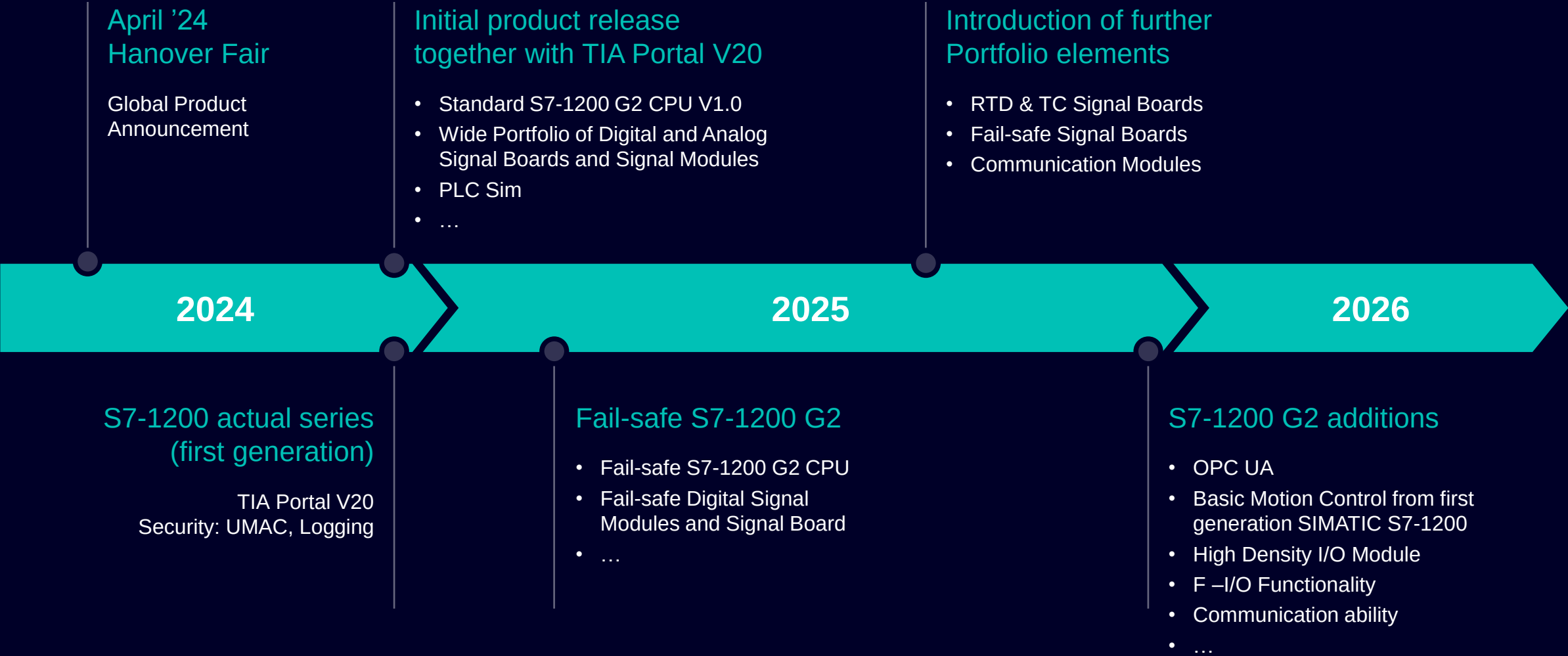
- STEP 7 Basic
 - One engineering package for standard and fail-safe
- S7-1200 (G2) standard & fail-safe incl. ET200 (F) periphery

STEP 7 Basic

One engineering for standard and fail-safe S7-1200 (G2)

SIMATIC S7-1200 G2

Roadmap – Summary and Outlook



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