SIMATIC

S7-1200 G2

Technical Slides

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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
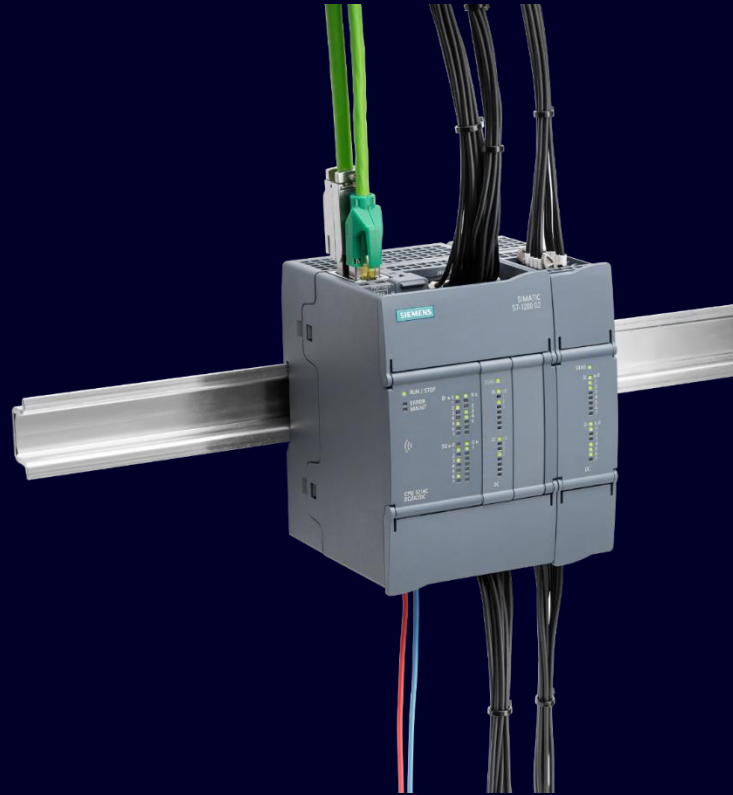
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SIMATIC S7-1200 G2
New standards in the field of basic automation controllers

Flexible Machine Safety

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).

Increased Performance

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.

Seamless scalability

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

Efficient 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

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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
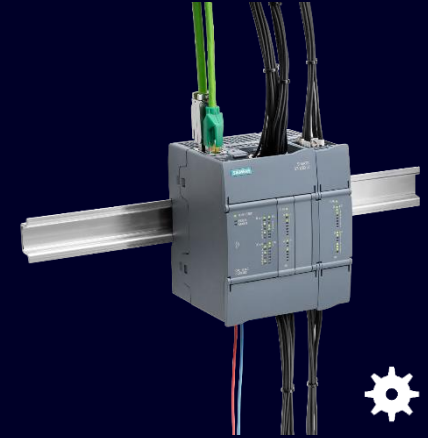- Two communication ports on each CPU

Controller, HMI and Networking
Everything developed in one software architecture

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Overview
Higher competence

Seamless Scalability

- Cost-optimized standard and fail-safe hardware portfolio
- HW: ~25% space reduction
- Fail-safe integrated
- Memory expansion

Flexible Machine Safety

- Integrated in the complete range
- Improved F-IO Portfolio with F-SBs and mixed I/O modules
- Integrated in STEP 7 Basic

Increased Performance

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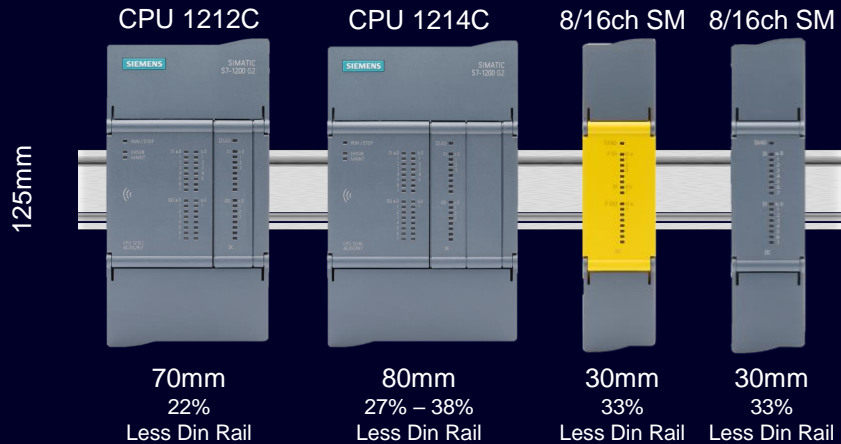- Near Field Communication (NFC) and App

Efficient Motion Control

Kinematics, Multi Axis Control, and Single Axis Control

ℹ **Scalable, powerful portfolio for the basic automation segment**

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Overview
Higher competence

New HW design

CPU 1212C   CPU 1214C   8/16ch SM   8/16ch SM

125mm

70mm	80mm	30mm	30mm
22%	27% – 38%	33%	33%
Less Din Rail	Less Din Rail	Less Din Rail	Less Din Rail

Increased performance and seamless scalability

- Enhanced processing power, dedicated communication performance and more memory
- Up to 31 PROFINET devices and synchronized program execution with PROFINET IRT
- Near Field Communication (NFC) for commissioning and diagnostics support
- Optimized scalable hardware portfolio and seamless scalability across all SIMATIC controllers

Flexible Machine Safety

- 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

Efficient motion control

- Kinematics
- Multi Axis control
- Single Axis control

Technology Objects

Expansion

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

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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	8/6	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

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Overview
Signal boards and signal modules

SBs

Digital SBs	Analog SBs
8 DI 24V 100 kHz	4 AI
8 DQ 24V 100 kHz	4 AQ
4 DI / 4 DQ 24V 100 kHz	2 AI / 2 AQ
4 DI / 4 DQ 5V 200 kHz	4 TC
	2 RTD

SMs

Digital SMs	Analog SMs
DI 16 x 24 V DC	8 AI
DQ 16 x 24 V DC 0.5 A	8 AQ
DQ 16 x Relay	4 AI / 4 AQ
8 DI / 8 DQ	8 TC
8 DI / 8 RLY	4 RTD

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Overview
Fail-safe: signal boards and signal modules

SBs

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

*Not within initial failsafe Portfolio release

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
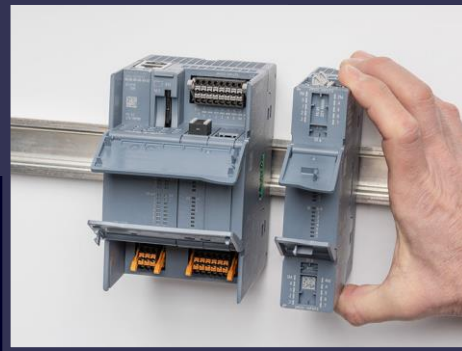
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Design and Handling
Highlights
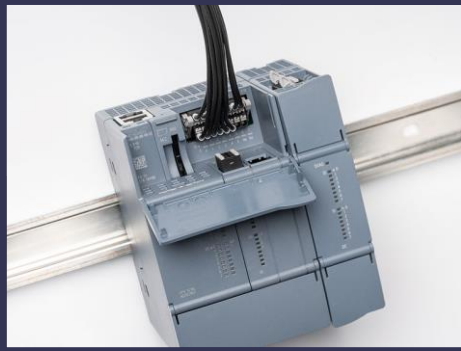
Memory Card access, 2xPN Ports and improved signal board concept (up to two SBs).
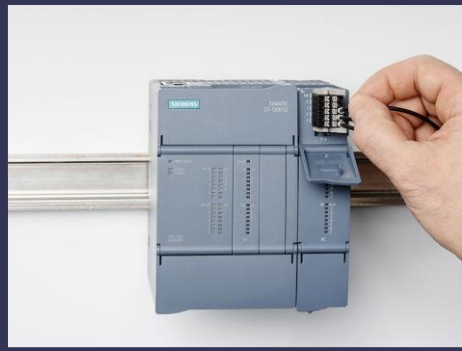
Removable high(er) density terminal blocks with push-in wiring for ease of use → non-contact pre-wiring position.

DIN rail footprint reduced by ~ 25%. Single, reliable bus connection system for both SMs and CMs.
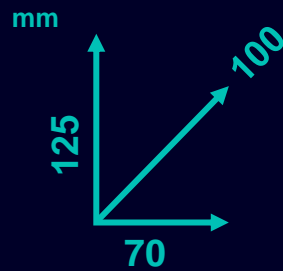
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CPU 1212C

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

mm
125
100
70

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

mm
125
100
80
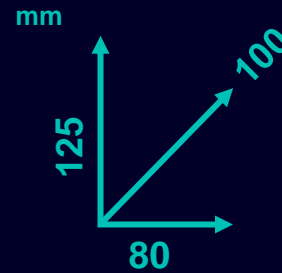
CPU 1214C

Fail-safe versions represented in yellow

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Design and Handling
Accessories: SIMATIC Memory Card

Capacity

- 4 MB
- 12 MB
- 24 MB
- 256 MB
- 2 GB
- 32 GB
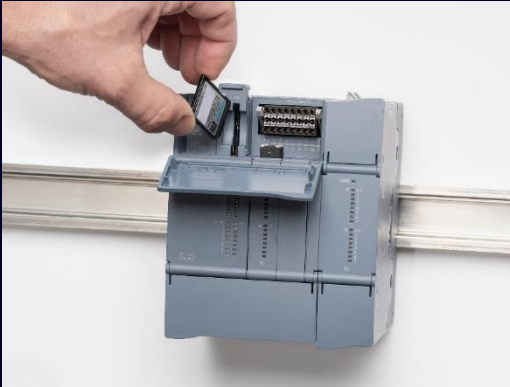
What can be saved on a S7-1200 memory card?

- 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

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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

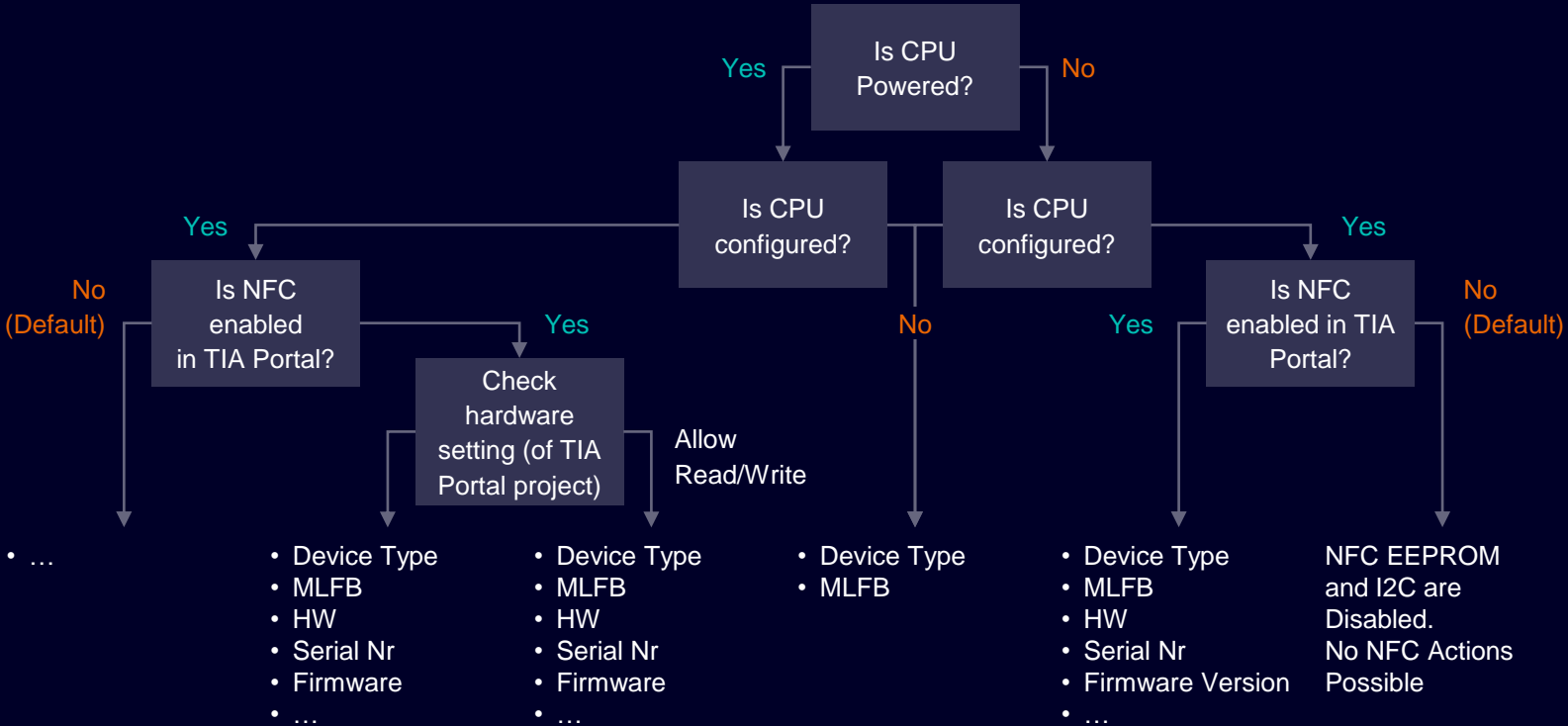***possibly slightly less features supported compared to SIMATIC S7-1500 T-CPU**

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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)

Is CPU Powered?
Yes → Is CPU configured?
No → Is CPU configured?

Is CPU configured?
Yes → Is NFC enabled in TIA Portal?
No → (Device Type, MLFB)

Is NFC enabled in TIA Portal?
No (Default) → …
Yes → Check hardware setting (of TIA Portal project)

Check hardware setting (of TIA Portal project)
Allow Read/Write

Is CPU configured?
Yes → Is NFC enabled in TIA Portal?

Is NFC enabled in TIA Portal?
Yes → (Device Type list)
No (Default) → NFC EEPROM and I2C are Disabled. No NFC Actions Possible

- …

- Device Type
- MLFB
- HW
- Serial Nr
- Firmware
- …

- Device Type
- MLFB
- HW
- Serial Nr
- Firmware
- …

- Device Type
- MLFB

- Device Type
- MLFB
- HW
- Serial Nr
- Firmware Version
- …

NFC EEPROM and I2C are Disabled. No NFC Actions Possible

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How to migrate technically

CPUs

Modules

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

S7-1200

Type of CPU	CPU 1211C	CPU 1212C	CPU 1212FC
Interfaces	[1]	[1]	[1]
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
Interfaces	[1] [1]	[1] [1]
Program memory/ Data memory	150/500 kB	200/500 kB
Bit performance (ns)	40	40
Integrated DI/DO	8/6	8/6
Integrated AI/AO	Optional SB	Optional SB
HSC	8	8
Width (mm)	70	70

■ PROFINET/IE

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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	1	1	1 / 1	1 / 1	1 / 1
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
Interfaces	1 / 1	1 / 1
Program memory/ Data memory	250/750 kB	300/750 kB
Bit performance (ns)	40	40
Integrated DI/DO	14/10	14/10
Integrated AI/AO	Optional SB	Optional SB
HSC	8	8
Width (mm)	80	80

■ PROFINET/IE

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TIA Portal V20

Engineering for standard and fail-safe S7-1200 G2

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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

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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
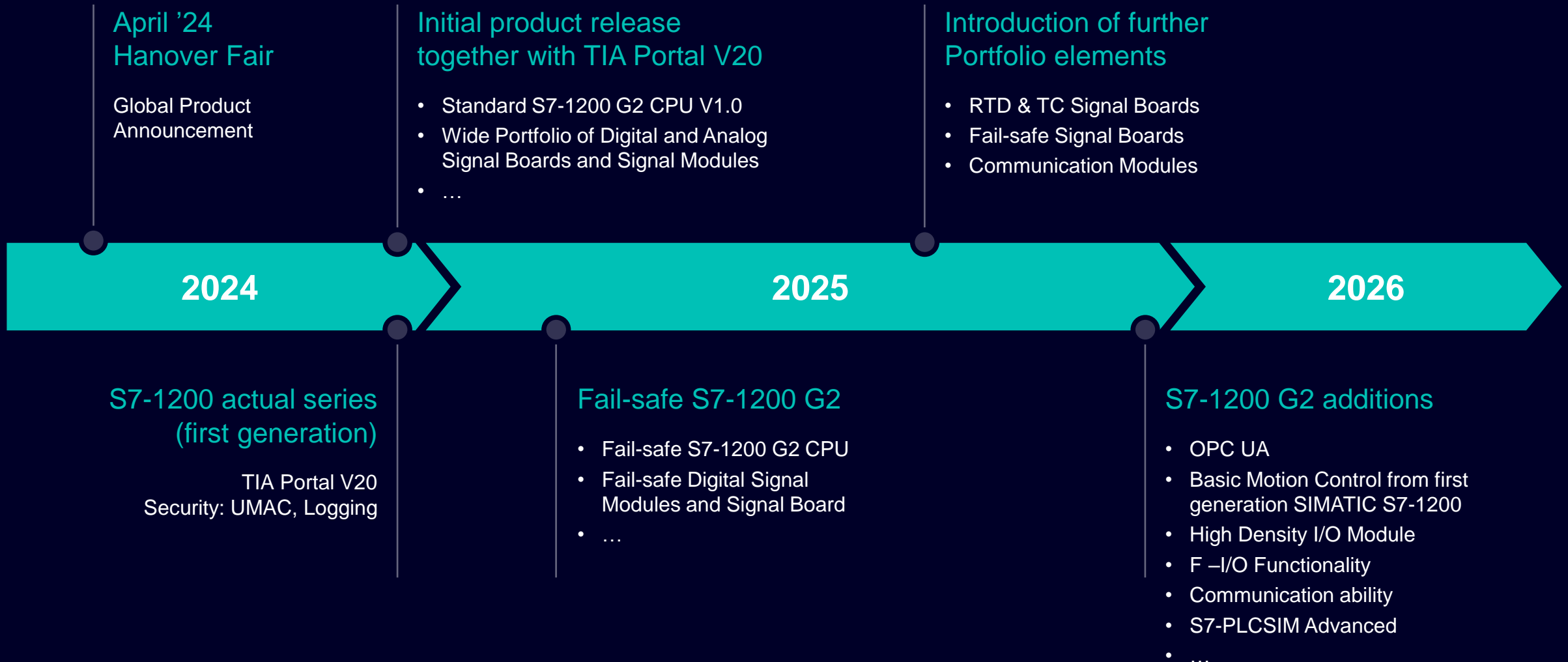
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STEP 7 Basic

- 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)

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SIMATIC S7-1200 G2
Roadmap – Summary and Outlook

April '24
Hanover Fair

Global Product
Announcement

Initial product release
together with TIA Portal V20

- Standard S7-1200 G2 CPU V1.0
- Wide Portfolio of Digital and Analog Signal Boards and Signal Modules
- …

Introduction of further
Portfolio elements

- RTD & TC Signal Boards
- Fail-safe Signal Boards
- Communication Modules

2024

2025

2026

S7-1200 actual series
(first generation)

TIA Portal V20
Security: UMAC, Logging

Fail-safe S7-1200 G2

- Fail-safe S7-1200 G2 CPU
- Fail-safe Digital Signal Modules and Signal Board
- …

S7-1200 G2 additions

- OPC UA
- Basic Motion Control from first generation SIMATIC S7-1200
- High Density I/O Module
- F –I/O Functionality
- Communication ability
- S7-PLCSIM Advanced
- …

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