

OFFICIAL MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

**6ES7317-6FF03-0AB0**

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# SIMATIC S7-300

## Central processing units

### Fail-safe CPUs

4

#### Overview CPU 317F-2 DP



- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For design of a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 to IEC 61508 and up to Cat. 4 according to EN 954-1
- Distributed fail-safe I/O modules can be connected through the two integral PROFIBUS DP interfaces (PROFIsafe).
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications

*Micro Memory Card required for operation of CPU.*

#### Overview CPU 317F-2 PN/DP



- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For design of a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 to IEC 61508 and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules in distributed stations can be connected through the integrated PROFINET interface (PROFIsafe) and/or through the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

*Micro Memory Card required for operation of CPU.*

#### Technical specifications

|                                                        | 6ES7 315-6FF01-0AB0          | 6ES7 315-2FH13-0AB0                                                         | 6ES7 317-6FF03-0AB0                                                           | 6ES7 317-2FK13-0AB0                                                         |
|--------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <b>Product status</b>                                  |                              |                                                                             |                                                                               |                                                                             |
| associated programming package                         | STEP 7 V5.1 or higher + SP 6 | STEP 7 V5.3 SP3 or higher + HW update, S7 Distributed Safety V5.4 or higher | STEP 7 V5.2 or higher SP1 + HW update, Distributed Safety 5.2 or higher + SP1 | STEP 7 V5.3 SP3 or higher + HW update, S7 Distributed Safety V5.4 or higher |
| <b>Supply voltages</b>                                 |                              |                                                                             |                                                                               |                                                                             |
| Rated value                                            |                              |                                                                             |                                                                               |                                                                             |
| • DC 24 V                                              | Yes                          | Yes                                                                         | Yes                                                                           | Yes                                                                         |
| • permissible range, lower limit (DC)                  | 20.4 V                       | 20.4 V                                                                      | 20.4 V                                                                        | 20.4 V                                                                      |
| • permissible range, upper limit (DC)                  | 28.8 V                       | 28.8 V                                                                      | 28.8 V                                                                        | 28.8 V                                                                      |
| <b>Voltages and currents</b>                           |                              |                                                                             |                                                                               |                                                                             |
| external protection for supply cables (recommendation) | min. 2 A                     | min. 2 A                                                                    | min. 2 A                                                                      | min. 2 A                                                                    |
| <b>Current consumption</b>                             |                              |                                                                             |                                                                               |                                                                             |
| Inrush current, typ.                                   | 2.5 A                        | 2.5 A                                                                       | 2.5 A                                                                         | 2.5 A                                                                       |
| I <sub>q</sub>                                         | 0,5 A <sup>2</sup> s         | 1 A <sup>2</sup> s                                                          | 1 A <sup>2</sup> s                                                            | 1 A <sup>2</sup> s                                                          |
| Current consumption (in no-load operation), typ.       | 60 mA                        | 100 mA                                                                      | 100 mA                                                                        | 100 mA                                                                      |
| Current consumption (rated value)                      |                              | 650 mA                                                                      |                                                                               | 650 mA                                                                      |

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# SIMATIC S7-300

## Central processing units

### Fail-safe CPUs

4

#### Technical specifications (continued)

|                                           | 6ES7 315-6FF01-0AB0                                                                                                                                                                              | 6ES7 315-2FH13-0AB0                                    | 6ES7 317-6FF03-0AB0                       | 6ES7 317-2FK13-0AB0                                  |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------|------------------------------------------------------|
| Power loss, typ.                          | 2.5 W                                                                                                                                                                                            | 3.5 W                                                  | 4 W                                       | 3.5 W                                                |
| <b>Memory</b>                             |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| Memory                                    |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| • RAM                                     |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| - integrated                              | 192 KByte; The number of F-instructions compared to a standard program is limited due to the F-specific overheads; depending on the type of programming, about 36 K F-instructions are possible. | 256 KByte; for program and data, less the display data | 1,024 KByte                               | 1 MByte; for program and data, less the display data |
| - expandable                              | No                                                                                                                                                                                               | No                                                     | No                                        | No                                                   |
| • Load memory                             |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| - pluggable (MMC)                         | Yes                                                                                                                                                                                              | Yes                                                    | Yes                                       | Yes                                                  |
| - pluggable (MMC), max.                   | 8 MByte                                                                                                                                                                                          | 8 MByte                                                | 8 MByte                                   | 8 MByte                                              |
| - expandable FEPRM                        |                                                                                                                                                                                                  | Pluggable via MMC                                      |                                           |                                                      |
| <b>Backup</b>                             |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| • present                                 | Yes; Guaranteed by MMC (maintenance-free)                                                                                                                                                        | Yes; Guaranteed by MMC (maintenance-free)              | Yes; Guaranteed by MMC (maintenance-free) | Yes; Guaranteed by MMC (maintenance-free)            |
| • without battery                         |                                                                                                                                                                                                  | Yes; Program and data                                  | Yes; Program and data                     | Yes; Program and data                                |
| <b>CPU/blocks</b>                         |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| <b>DB</b>                                 |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| • Number, max.                            | 1,023; DB 0 reserved                                                                                                                                                                             | 1,023; Number band: 1 to 1023                          | 2,047; Number band: 1 to 2047             | 2,047; Number band: 1 to 2047                        |
| • Size, max.                              | 16 KByte                                                                                                                                                                                         | 16 KByte                                               | 64 KByte                                  | 64 KByte                                             |
| <b>FB</b>                                 |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| • Number, max.                            | 2,048; See Operation List                                                                                                                                                                        | 1,024; Number band: 0 to 2047                          | 2,048; Number band: 0 to 2047             | 2,048; Number band: 0 to 2047                        |
| • Size, max.                              | 16 KByte                                                                                                                                                                                         | 16 KByte                                               | 64 KByte                                  | 64 KByte                                             |
| <b>FC</b>                                 |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| • Number, max.                            | 2,048; See Operation List                                                                                                                                                                        | 1,024; Number band: 0 to 2047                          | 2,048; Number band: 0 to 2047             | 2,048; Number band: 0 to 2047                        |
| • Size, max.                              | 16 KByte                                                                                                                                                                                         | 16 KByte                                               | 64 KByte                                  | 64 KByte                                             |
| <b>OB</b>                                 |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| • Number, max.                            |                                                                                                                                                                                                  | See Operation List                                     | See Operation List                        | See Operation List                                   |
| • Size, max.                              | 16 KByte                                                                                                                                                                                         | 16 KByte                                               | 64 KByte                                  | 64 KByte                                             |
| <b>Nesting depth</b>                      |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| • per priority class                      | 8                                                                                                                                                                                                | 8                                                      | 16                                        | 16                                                   |
| • additional within an error OB           | 4                                                                                                                                                                                                | 4                                                      | 4                                         | 4                                                    |
| <b>CPU/processing times</b>               |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| for bit operations, min.                  | 0.1 µs                                                                                                                                                                                           | 0.1 µs                                                 | 0.05 µs                                   | 0.05 µs                                              |
| for word operations, min.                 | 0.2 µs                                                                                                                                                                                           | 0.2 µs                                                 | 0.2 µs                                    | 0.2 µs                                               |
| for fixed point arithmetic, min.          | 2 µs                                                                                                                                                                                             | 2 µs                                                   | 0.2 µs                                    | 0.2 µs                                               |
| for floating point arithmetic, min.       | 6 µs                                                                                                                                                                                             | 3 µs                                                   | 1 µs                                      | 1 µs                                                 |
| <b>Times/counters and their remanence</b> |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| <b>S7 counter</b>                         |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| • Number                                  | 256                                                                                                                                                                                              | 256                                                    | 512                                       | 512                                                  |
| • of which remanent without battery       |                                                                                                                                                                                                  |                                                        |                                           |                                                      |
| - adjustable                              | Yes                                                                                                                                                                                              | Yes                                                    | Yes                                       | Yes                                                  |
| - lower limit                             |                                                                                                                                                                                                  | 0                                                      |                                           | 0                                                    |
| - upper limit                             |                                                                                                                                                                                                  | 255                                                    |                                           | 511                                                  |

# SIMATIC S7-300

## Central processing units

### Fail-safe CPUs

4

#### Technical specifications (continued)

|                                       | 6ES7 315-6FF01-0AB0     | 6ES7 315-2FH13-0AB0                   | 6ES7 317-6FF03-0AB0                   | 6ES7 317-2FK13-0AB0                   |
|---------------------------------------|-------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| • Remanence                           |                         |                                       |                                       |                                       |
| - adjustable                          |                         | Yes                                   | Yes                                   | Yes                                   |
| - lower limit                         |                         | 0                                     | 0                                     | 0                                     |
| - upper limit                         |                         | 255                                   | 511                                   | 511                                   |
| • Counting range                      |                         |                                       |                                       |                                       |
| - adjustable                          |                         | Yes                                   | Yes                                   | Yes                                   |
| - lower limit                         | 0                       | 0                                     | 0                                     | 0                                     |
| - upper limit                         | 999                     | 999                                   | 999                                   | 999                                   |
| IEC counter                           |                         |                                       |                                       |                                       |
| • present                             | Yes                     | Yes                                   | Yes                                   | Yes                                   |
| • Type                                | SFB                     | SFB                                   | SFB                                   | SFB                                   |
| S7 times                              |                         |                                       |                                       |                                       |
| • Number                              | 256                     | 256                                   | 512                                   | 512                                   |
| • Remanence                           |                         |                                       |                                       |                                       |
| - adjustable                          | Yes                     | Yes                                   | Yes                                   | Yes                                   |
| - lower limit                         |                         | 0                                     | 0                                     | 0                                     |
| - upper limit                         |                         | 255                                   | 511                                   | 511                                   |
| - preset                              | no retentivity          | no retentivity                        | no retentivity                        | no retentivity                        |
| • Time range                          |                         |                                       |                                       |                                       |
| - lower limit                         | 10 ms                   | 10 ms                                 | 10 ms                                 | 10 ms                                 |
| - upper limit                         | 9,990 s                 | 9,990 s                               | 9,990 s                               | 9,990 s                               |
| IEC timer                             |                         |                                       |                                       |                                       |
| • present                             | Yes                     | Yes                                   | Yes                                   | Yes                                   |
| • Type                                | SFB                     | SFB                                   | SFB                                   | SFB                                   |
| <b>Data areas and their remanence</b> |                         |                                       |                                       |                                       |
| Flag                                  |                         |                                       |                                       |                                       |
| • Number, max.                        | 2,048 Byte              | 2,048 Byte                            | 4,096 Byte                            | 4,096 Byte                            |
| • Remanence available                 | Yes;<br>MB 0 to MB 2047 | Yes;<br>MB 0 to MB 2047               | Yes;<br>MB 0 to MB 4095               | Yes;<br>MB 0 to MB 4095               |
| • Number of clock memories            | 8; 1 memory byte        | 8; 1 memory byte                      | 8; 1 memory byte                      | 8; 1 memory byte                      |
| Data blocks                           |                         |                                       |                                       |                                       |
| • Number, max.                        | 1,023; DB 0 reserved    | 1,023;<br>from DB 1 to DB 1023        | 2,047;<br>from DB 1 to DB 2047        | 2,047;<br>from DB 1 to DB 2047        |
| • Size, max.                          | 16 KByte                | 16 KByte                              | 64 KByte                              | 64 KByte                              |
| • Remanence adjustable                |                         | Yes; via non-retain<br>property on DB | Yes; via non-retain<br>property on DB | Yes; via non-retain<br>property on DB |
| • Remanence preset                    |                         | Yes                                   | Yes                                   | Yes                                   |
| Local data                            |                         |                                       |                                       |                                       |
| • per priority class, max.            | 1,024 Byte              | 1,024 Byte;<br>per block max. 510     | 1,024 Byte                            | 1,024 Byte                            |
| <b>Address area</b>                   |                         |                                       |                                       |                                       |
| I/O address area                      |                         |                                       |                                       |                                       |
| • Inputs                              | 2 KByte                 | 2 KByte                               | 8 KByte                               | 8 KByte                               |
| • Outputs                             | 2 KByte                 | 2 KByte                               | 8 KByte                               | 8 KByte                               |
| • of which, distributed               |                         |                                       |                                       |                                       |
| - Inputs                              | 2 KByte                 | 2 KByte                               | 8 KByte                               | 8 KByte                               |
| - Outputs                             | 2 KByte                 | 2 KByte                               | 8 KByte                               | 8 KByte                               |

# SIMATIC S7-300

## Central processing units

Fail-safe CPUs

4

### Technical specifications (continued)

|                                              | 6ES7 315-6FF01-0AB0                            | 6ES7 315-2FH13-0AB0                                 | 6ES7 317-6FF03-0AB0                            | 6ES7 317-2FK13-0AB0                            |
|----------------------------------------------|------------------------------------------------|-----------------------------------------------------|------------------------------------------------|------------------------------------------------|
| Process image                                |                                                |                                                     |                                                |                                                |
| • Inputs                                     | 384 Byte                                       | 384 Byte                                            | 1,024 Byte                                     | 2,048 Byte                                     |
| • Outputs                                    | 384 Byte                                       | 384 Byte                                            | 1,024 Byte                                     | 2,048 Byte                                     |
| • Inputs, adjustable                         |                                                |                                                     |                                                | 2,048 Byte                                     |
| • Outputs, adjustable                        |                                                |                                                     |                                                | 2,048 Byte                                     |
| • Inputs, preset                             |                                                |                                                     |                                                | 1,024 Byte                                     |
| • Outputs, preset                            |                                                |                                                     |                                                | 1,024 Byte                                     |
| Digital channels                             |                                                |                                                     |                                                |                                                |
| • Inputs                                     | 16,384                                         | 16,384                                              | 65,536                                         | 65,536                                         |
| • Outputs                                    | 16,384                                         | 16,384                                              | 65,536                                         | 65,536                                         |
| • Inputs, of which central                   | 1,024                                          | 1,024; max.                                         | 1,024                                          | 1,024                                          |
| • Outputs, of which central                  | 1,024                                          | 1,024; max.                                         | 1,024                                          | 1,024                                          |
| Analog channels                              |                                                |                                                     |                                                |                                                |
| • Inputs                                     | 1,024                                          | 1,024                                               | 4,096                                          | 4,096                                          |
| • Outputs                                    | 1,024                                          | 1,024                                               | 4,096                                          | 4,096                                          |
| • Inputs, of which central                   | 256                                            | 256; max.                                           | 256                                            | 256                                            |
| • Outputs, of which central                  | 256                                            | 256; max.                                           | 256                                            | 256                                            |
| <b>Hardware config.</b>                      |                                                |                                                     |                                                |                                                |
| Central devices, max.                        |                                                | 1                                                   | 1                                              | 1                                              |
| Expansion devices, max.                      |                                                | 3                                                   | 3                                              | 3                                              |
| Racks, max.                                  | 4                                              | 4                                                   | 4                                              | 4                                              |
| Modules per rack, max.                       | 8                                              | 8                                                   | 8                                              | 8                                              |
| Number of DP masters                         |                                                |                                                     |                                                |                                                |
| • integrated                                 | 1                                              | 1                                                   | 2                                              | 1                                              |
| • via CP                                     | 1                                              | 4                                                   | 4                                              | 4                                              |
| Number of operable FMs and CPs (recommended) |                                                |                                                     |                                                |                                                |
| • FM                                         | 8                                              | 8                                                   | 8                                              | 8                                              |
| • CP, point-to-point                         | 8                                              | 8                                                   | 8                                              | 8                                              |
| • CP, LAN                                    | 10                                             | 10                                                  | 10                                             | 10                                             |
| <b>Time</b>                                  |                                                |                                                     |                                                |                                                |
| Clock                                        |                                                |                                                     |                                                |                                                |
| • Hardware clock (real-time clock)           | Yes                                            | Yes                                                 | Yes                                            | Yes                                            |
| • Battery backed and synchronized            | Yes                                            | Yes                                                 | Yes                                            | Yes                                            |
| • Deviation per day, max.                    | 10 s                                           | 10 s                                                | 10 s                                           | 10 s                                           |
| Operating hours counter                      |                                                |                                                     |                                                |                                                |
| • Number                                     | 1                                              | 1                                                   | 4                                              | 4                                              |
| • Number/Number range                        | 0                                              | 0                                                   | 0 to 3                                         | 0 to 3                                         |
| • Range of values                            | 0 to 2 <sup>31</sup> hours (when using SFC101) | 2 to the power of 31 hours (when using the SFC 101) | 0 to 2 <sup>31</sup> hours (when using SFC101) | 0 to 2 <sup>31</sup> hours (when using SFC101) |
| • Granularity                                | 1 hour                                         | 1 hour                                              | 1 hour                                         | 1 hour                                         |
| • remanent                                   | Yes; must be restarted at each warm restart    | Yes; must be restarted at each warm restart         | Yes; must be restarted at each warm restart    | Yes; must be restarted at each warm restart    |
| Clock synchronization                        |                                                |                                                     |                                                |                                                |
| • supports                                   | Yes                                            | Yes                                                 | Yes                                            | Yes                                            |
| • to MPI, Master                             | Yes                                            | Yes                                                 | Yes                                            | Yes                                            |
| • to MPI, Slave                              | Yes                                            | Yes                                                 | Yes                                            | Yes                                            |
| • in AS, Master                              | Yes                                            | Yes                                                 | Yes                                            | Yes                                            |
| • in AS, Slave                               |                                                | Yes                                                 | Yes                                            | Yes                                            |