

MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

Reference package for procurement and maintenance review

ET 200S

## 6ES7151-7AA21-0AB0

IM 151-7 CPU INTERFACE MODULE

Used with the applicable SIMATIC ET 200S configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens official manufacturer documentation

## 11.2.2 Technical specifications IM151-7 CPU

Table 11- 1 Technical specifications of the IM151-7 CPU interface module

| <b>Technical specifications</b>                                           |                                                                 |
|---------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>IM151-7 CPU and version</b>                                            |                                                                 |
| Order number                                                              | 6ES7151-7AA21-0AB0                                              |
| • Hardware version                                                        | 01                                                              |
| • Firmware version                                                        | V 3.3                                                           |
| • Associated programming package                                          | STEP 7 as of V5.2 + SP1 + HSP219 or V5.5 + SP1                  |
| <b>Dimensions and weight</b>                                              |                                                                 |
| Dimensions W x H x D (mm)                                                 | 60 x 119.5 x 75                                                 |
| Weight                                                                    | ca. 200 g                                                       |
| <b>Memory</b>                                                             |                                                                 |
| Work memory                                                               |                                                                 |
| • Work memory                                                             | 128 KB                                                          |
| • Expandable                                                              | No                                                              |
| • Capacity of the retentive memory for retentive data blocks              | 64 KB                                                           |
| Load memory                                                               |                                                                 |
| • Pluggable (MMC)                                                         | Yes                                                             |
| • Pluggable (MMC), max.                                                   | 8 MB                                                            |
| Buffering                                                                 | Yes (ensured with SIMATIC Micro Memory Card - maintenance-free) |
| Data retention on the SIMATIC Micro Memory Card (after final programming) | At least 10 years                                               |
| <b>Execution times</b>                                                    |                                                                 |
| Processing times of                                                       |                                                                 |
| • Bit operations                                                          | 0.06 µs                                                         |
| • Word instructions                                                       | 0.12 µs                                                         |
| • Fixed-point arithmetic                                                  | 0.16 µs                                                         |
| • Floating-point arithmetic                                               | 0.59 µs                                                         |
| <b>Timers / counters and their retentivity</b>                            |                                                                 |
| S7 counters                                                               |                                                                 |
| • Number                                                                  | 256                                                             |
| • Retentivity, configurable                                               | Yes                                                             |
| • Retentivity, preset                                                     | From C0 to C7                                                   |
| • Counting range                                                          | 0 to 999                                                        |

| Technical specifications                     |                                                                                                                                                                                        |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IEC Counters                                 |                                                                                                                                                                                        |
| • Available                                  | Yes                                                                                                                                                                                    |
| • Type                                       | SFB                                                                                                                                                                                    |
| • Number                                     | Unlimited<br>(limited only by work memory)                                                                                                                                             |
| S7 timers                                    |                                                                                                                                                                                        |
| • Number                                     | 256                                                                                                                                                                                    |
| • Retentivity, configurable                  | Yes                                                                                                                                                                                    |
| • Retentivity, preset                        | Not retentive                                                                                                                                                                          |
| • Timer range                                | 10 ms to 9990 s                                                                                                                                                                        |
| IEC timers                                   |                                                                                                                                                                                        |
| • Type                                       | SFB                                                                                                                                                                                    |
| • Number                                     | Unlimited<br>(limited only by work memory)                                                                                                                                             |
| Data areas and their retentive address areas |                                                                                                                                                                                        |
| Bit memory                                   |                                                                                                                                                                                        |
| • Number, max.                               | 256 bytes                                                                                                                                                                              |
| • Retentivity, configurable                  | Yes, from MB0 to MB255                                                                                                                                                                 |
| • Retentivity, preset                        | From MB0 to MB15                                                                                                                                                                       |
| Number of clock memories                     | 8 (1 memory byte)                                                                                                                                                                      |
| Local data per priority class, max.          | 32 KB per runtime level / 2 KB per block                                                                                                                                               |
| Blocks                                       |                                                                                                                                                                                        |
| Total number of blocks                       | 1024 (DBs, FCs, FBs)<br>The maximum number of blocks that can be loaded may be reduced if you are using another SIMATIC Micro Memory Card.                                             |
| OBs                                          | See S7300-CPU and ET 200-CPU Instruction List<br>( <a href="http://support.automation.siemens.com/WW/view/en/31977679">http://support.automation.siemens.com/WW/view/en/31977679</a> ) |
| • Size, max.                                 | 64 KB                                                                                                                                                                                  |
| • Number of free-cycle OBs                   | 1 (OB 1)                                                                                                                                                                               |
| • Number of time-of-day interrupt OBs        | 1 (OB 10)                                                                                                                                                                              |
| • Number of time-delay interrupt OBs         | 2 (OB 20, 21)                                                                                                                                                                          |
| • Number of cyclic interrupt OBs             | 4 (OB 32, OB 33, OB 34, OB 35)                                                                                                                                                         |
| • Number of hardware interrupt OBs           | 1 (OB 40)                                                                                                                                                                              |
| • Number of DPV1 interrupt OBs               | 3 (OB 55, 56, 57)                                                                                                                                                                      |
| • Number of asynchronous error OBs           | 6 (OB 80, 82, 83, 85, 86, 87)<br>(OB 83 only for centralized I/O, not for DP)                                                                                                          |
| • Number of startup OBs                      | 1 (OB 100)                                                                                                                                                                             |
| • Number of synchronous error interrupt OBs  | 2 (OB 121, 122)                                                                                                                                                                        |

| Technical specifications                                    |                                         |
|-------------------------------------------------------------|-----------------------------------------|
| Nesting depth                                               |                                         |
| • Per priority class                                        | 16                                      |
| • Additional within an error OB                             | 4                                       |
| FBs                                                         | See <i>Instruction List</i>             |
| • Number, max.                                              | 1024<br>(in the number range 0 to 7999) |
| • Size                                                      | 64 KB                                   |
| FCs                                                         | See <i>Instruction List</i>             |
| • Number, max.                                              | 1024<br>(in the number range 0 to 7999) |
| • Size                                                      | 64 KB                                   |
| Data blocks                                                 |                                         |
| • Number, max.                                              | 1024 (in the number range 1 to 16000)   |
| • Size, max.                                                | 64 KB                                   |
| • Non-retain support (configurable retentive address areas) | Yes                                     |
| Address areas (I/O)                                         |                                         |
| Total I/O address area                                      |                                         |
| • Inputs, freely adressable                                 | 2048 bytes                              |
| • Outputs, freely adressable                                | 2048 bytes                              |
| • Of which distributed                                      |                                         |
| – Inputs, freely adressable                                 | 2048 bytes                              |
| – Outputs, freely adressable                                | 2048 bytes                              |
| Process I/O image                                           |                                         |
| • Inputs, adjustable                                        | 2048 bytes                              |
| • Outputs, adjustable                                       | 2048 bytes                              |
| • Inputs, preset                                            | 128 bytes                               |
| • Outputs, preset                                           | 128 bytes                               |
| Digital channels                                            |                                         |
| • Inputs                                                    | 16336                                   |
| • Outputs                                                   | 16336                                   |
| • Inputs, central                                           | 496                                     |
| • Outputs, central                                          | 496                                     |
| Analog channels                                             |                                         |
| • Inputs                                                    | 1021                                    |
| • Outputs                                                   | 1021                                    |
| • Inputs, central                                           | 124                                     |
| • Outputs, central                                          | 124                                     |

| Technical specifications                                     |                                                                                            |
|--------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Removal</b>                                               |                                                                                            |
| Mounting rail                                                | 1                                                                                          |
| I/O module for each ET 200S                                  | Max. 63                                                                                    |
| Station width                                                | ≤ 1 m or < 2 m                                                                             |
| Current carrying capacity per load group (power module)      | Max. 10 A                                                                                  |
| <b>Time-of-day</b>                                           |                                                                                            |
| Clock                                                        |                                                                                            |
| • Hardware clock (real-time clock)                           | Yes                                                                                        |
| • Factory setting                                            | DT#1994-01-01-00:00:00                                                                     |
| • Buffered, can be synchronized                              | Yes                                                                                        |
| • Buffered period                                            | Typically 6 weeks<br>(at an ambient temperature of 40 °C)                                  |
| • Behavior of the clock on expiration of the buffered period | The clock keeps running, continuing at the time-of-day it had when power was switched off. |
| • Behavior of the real-time clock after POWER ON             | The clock continues running after POWER OFF.                                               |
| • Deviation per day                                          | typ. 2 s, max. 10 s                                                                        |
| Operating hours counter                                      |                                                                                            |
| • Number                                                     | 1                                                                                          |
| • Number                                                     | 0                                                                                          |
| • Value range                                                | 0 to 2 <sup>31</sup> hours<br>(using the SFC 101)                                          |
| • Granularity                                                | 1 hour                                                                                     |
| • Retentive                                                  | Yes; must be manually restarted after every restart                                        |
| Time synchronization                                         |                                                                                            |
| • Supported                                                  | Yes                                                                                        |
| • On MPI, time master                                        | Yes                                                                                        |
| • On MPI, time slave                                         | Yes                                                                                        |
| • On DP, time master                                         | Yes (DP slave must be time slave)                                                          |
| • On DP, time slave                                          | Yes                                                                                        |
| • On the AS, time master                                     | No                                                                                         |
| • On the AS, time slave                                      | No                                                                                         |