

SIEMENS

Product Information to the manual

Distributed I/O device ET 200iS, Version 10/2001

Introduction

This product information contains fixes and additional information relevant to the user manual "Distributed I/O device ET 200iS", versions 10/2001, order no. 6ES7 151-2AA00-8BA0.

1 Configuration options in zones: see *Chapter 4.4 in the ET 200iS Manual*

Rules for the configuration of ET 200iS in Zone 1, Zone 2 and in the safety area

Note

- Connect the fieldbus isolation transformer to the start of the PROFIBUS-DP segment. The fieldbus transformer is always required and must be installed in the safety area!
 - Enable the terminating resistor on the fieldbus isolation transformer.
-

2 Using ET 200iS in a redundant DP standard master system: see Chapter 4.7 of the ET 200iS manual

Restrictions

Since SIMATIC PDM can not access ET 200iS via the Y link, it must be connected to the PROFIBUS-DP segment downstream of the Y link (secondary side).

3 Limitation of the number of connectible electronic modules/maximum configuration: see Chapter 4.8 of the ET 200iS manual

Number of electronic modules

Each ET 200iS station consists of a maximum of 32 electronic modules, including digital and analog electronic modules.

The actual number of electronic modules is often limited by

- the safety-relevant maximum current for which the system is designed (Limit value: < 7000 mA).
- the current of the power supply module PS. This limit (maximum permitted) current depends on ambient temperature at the PS power supply module and may not be exceeded.

Unrestricted use and combination of modules in an ET 200iS is possible with the configurations shown below:

- **ET 200iS up to 20 electronic modules, at an ambient temperature of 40 °C**
(Limit value: < 5000 mA)
- **ET 200iS up to 19 electronic modules, at an ambient temperature of 50 °C**
(Limit value: < 4650 mA)
- **ET 200iS up to 17 electronic modules, at an ambient temperature of 60 °C**
(Limit value: < 4300 mA)

For operation with a **higher number** of electronic modules (maximum 32) you must check your configuration according to the **calculation table (see Table 1)**.

Calculation table

Use the calculation table to check the safety-relevant and typical current consumption of ET 200iS.

These typical current values represent those of an average plant configuration.

The following simultaneity factors apply to the ET 200iS station:

- with DI of 65 %
- with DO of 80 %
- with AI of 80 %
- with AO of 80 %

If the specified simultaneity factors are too low for your application, you must base the calculated current consumption on maximum values (see Chapter 5 in this product info).

Procedure

You must **check the safety-relevant and typical current consumption of your ET200iS configuration!**The limit values specified in the table columns =*safety-relevant current consumption in mA* and = *typical current consumption in mA* must **not be exceeded**.

1. Multiply the safety-relevant current value of each module by the number of modules and then enter the result in the column *x Number of modules* and = *and safety-relevant current consumption in mA* .
2. Multiply the typical current value of each module by the number of modules and then enter the result in the column = *typical current consumption in mA* .
3. Add all modules and enter the value in the field *Total number of modules* (max. 32 electronic modules).
4. Add the safety-relevant current consumption and enter the sum in the field *Accumulative current consumption*.
5. Add the typical current consumption and enter the sum in the field *Accumulative current consumption*.
6. Compare the calculated sum totals with the specified limit values.

Table 1 Current consumption calculation table

Electronic modules	x number of modules	safety-relevant current per module in mA	= safety-relevant current consumption in mA .	typical current per module in mA	= typical current consumption in mA
4DI NAMUR	x	200 mA	=	80 mA	=
2DO 25VDC/25mA ¹	x	330 mA	=	240 mA	=
2DO 25VDC/25mA ²	x	330 mA	=	160 mA	=
2AI I 2WIRE	x	330 mA	=	200 mA	=
2AI I 4WIRE	x	120 mA	=	50 mA	=
2AI RTD	x	120 mA	=	50 mA	=
2AI TC	x	120 mA	=	50 mA	=
2AO I	x	330 mA	=	200 mA	=
2AI I 2WIRE HART	x	330 mA	=	200 mA	=
2AI I 4WIRE HART	x	120 mA	=	50 mA	=
2AO I HART	x	330 mA	=	200 mA	=
	Total number of modules =		Total current consumption =	Simultaneity factors with typ. current DI: 65%, DO: 80%, AI: 80%, AO: 80%	Accumulative current consumption =
	max. 32		< 7000 mA		< 5000 mA at 40 °C
					< 4650 mA at 50 °C
					< 4300 mA at 60 °C

¹ The maximum current consumption of the connected valves is 25 mA.

² The maximum current consumption of the connected valves is 12 mA.

Example

An ET 200iS is operated at an ambient temperature of 50 °C . It consists of the following electronic modules:

- 5 modules 4DI NAMUR,
- 5 modules 2DO 25VDC/25mA with 25–mA valves
- 2 modules 2DO 25VDC/12mA with 25–mA valves
- 3 modules 2AI I 2WIRE

- 5 modules 2AI I 4WIRE
- 5 modules 2AI RTD
- 4 modules 2AI TC
- 3 modules 2AO I

When operating with 32 electronic modules at an ambient temperature of 50 °C, the current consumption needs to be checked (< 4650 mA and < 7000 mA):

Table 2 Current consumption calculation table

Electronic modules	x number of modules	safety-relevant current per module in mA	= safety-relevant current consumption in mA .	typical current per module in mA	= typical current consumption in mA
4DI NAMUR	x 5	200 mA	= 1000 mA	80 mA	= 400 mA
2DO 25VDC/25mA ¹	x 5	330 mA	= 1650 mA	240 mA	= 1200 mA
2DO 25VDC/25mA ²	x 2	330 mA	= 660 mA	160 mA	= 320 mA
2AI I 2WIRE	x 3	330 mA	= 990 mA	200 mA	= 600 mA
2AI I 4WIRE	x 5	120 mA	= 600 mA	50 mA	= 250 mA
2AI RTD	x 5	120 mA	= 600 mA	50 mA	= 250 mA
2AI TC	x 4	120 mA	= 480 mA	50 mA	= 200 mA
2AO I	x 3	330 mA	= 990 mA	200 mA	= 600 mA
2AI I 2WIRE HART	x	330 mA	=	200 mA	=
2AI I 4WIRE HART	x	120 mA	=	50 mA	=
2AO I HART	x	330 mA	=	200 mA	=
	Total number of modules = 32 modules		Total current consumption = 6970 mA result is OK!	Simultaneity factors with typ. current DI: 65%, DO: 80%, AI: 80%, AO: 80%	Total current consumption = 3820 mA result is OK!
	max. 32		< 7000 mA		< 5000 mA at 40 °C
					< 4650 mA at 50 °C
					< 4300 mA at 60 °C

¹ The maximum current consumption of the connected valves is 25 mA.

² The maximum current consumption of the connected valves is 12 mA.

Note

The limit values were complied with under both conditions (safety-relevant and typical current consumption). The ET 200iS can therefore be operated with this configuration.

It must be ensured that the maximum ambient temperature of 50 °C at the power supply module PS is not exceeded.

4 Installation rules: see *Chapter 5.1 of the ET 200iS manual*

Cubicle for ET 200iS in Zone 1

The ET 200iS must be installed in a metal cubicle (stainless steel or steel sheet) of the protection class EEx e (Increased safety).

Cubicle for ET 200iS in Zone 2

The ET 200iS must be installed in a metal cubicle (stainless steel or steel sheet) of the minimum protection class IP 54. A manufacturer's declaration of compatibility has to be available for operation of the cubicle in Zone 2 (according to EN 50021).

5 Technical data of the electronic modules: see Chapters 13, 14 and 15 of the ET 200iS manual

Maximum current consumption of the electronic modules

Valid for the maximum current consumption is a simultaneity factor of 100 %, that is, all channels of the ET 200iS station are active simultaneously under maximum power consumption.

Table 3 Maximum current consumption of the electronic modules

Electronic module	Maximum current consumption in mA
4DI NAMUR	90 mA
2DO 25VDC/25mA ¹	270 mA
2DO 25VDC/25mA ²	170 mA
2AI I 2WIRE	250 mA
2AI I 4WIRE	50 mA
2AI RTD	50 mA
2AI TC	50 mA
2AO I	250 mA
2AI I 2WIRE HART	250 mA
2AI I 4WIRE HART	50 mA
2AO I HART	250 mA

¹ The maximum current consumption of the connected valves is 25 mA.

² The maximum current consumption of the connected valves is 12 mA.

6 Standards and certifications for the power supply module

The power supply module itemised in Table 4 fulfills the following standards and certifications.


Table 4 Power supply module

Power supply module	Order no.
Power supply module	6ES7138-5EA00-0AA0

ATEX certification



PTB 01 ATEX 2121
according to EN 1127-1:1997, EN 50014:1997+A1+A2, EN 50018:1994,
EN 50019:1994 and EN 50020:1994

 II 2 G EEx de [ib/ia] IIC/IIB T4

The EC declarations of conformity are kept on file at the following address for the authorities in charge:

Siemens Aktiengesellschaft
Automation and Drives Division
A&D AS RD ST Type Test
Postfach 1963
D-92209 Amberg

UL/CSA certification



HAZ. LOC.

See *Control Drawing A5E00158421-01*

FM certification



See *Control Drawing A5E00158421-01*

7 Standards and certifications for the interface module


The interface module itemised in Table 5 fulfills the following standards and certifications.

Table 5 Interface module

Interface module	Order no.
Interface module	6ES7151-2AA00-0AB0

ATEX certification



PTB 01 ATEX 2122
according to EN 50014:1997+A1+A2 and EN 50020:1994
 II 2 G EEx ib IIB/IIC T4

The EC declarations of conformity are kept on file at the following address for the authorities in charge:

Siemens Aktiengesellschaft
Automation and Drives Division
A&D AS RD ST Type Test
Postfach 1963
D-92209 Amberg

UL/CSA certification



See *Control Drawing A5E00158421-01*

HAZ. LOC.

FM certification



See *Control Drawing A5E00158421-01*

8 Standards and certifications of the electronics modules

The electronics modules itemised in Table 6 fulfill the following standards and certifications.

Table 6 Electronics modules

Electronics modules	Order no.
4DI NAMUR	6ES7131-5RD00-0AB0
2DO DC25V/25mA	6ES7132-5SB00-0AB0
2AI I 2WIRE	6ES7134-5RB00-0AB0
2AI I 4WIRE	6ES7134-5RB50-0AB0
2AI RTD	6ES7134-5SB50-0AB0
2AI TC	6ES7134-5SB00-0AB0
2AI I 2WIRE HART	6ES7134-5TB00-0AB0
2AI I 4WIRE HART	6ES7134-5TB50-0AB0
2AO I	6ES7135-5RB00-0AB0
2AO I HART	6ES7135-5TB00-0AB0

ATEX certification



KEMA 01 ATEX 1150, 1151, 1152, 1153, 1154, 1155, 1156 X
according to EN 50014:1997, EN 50020:1994 and EN 50284:1999

II 2 G (1) GD EEx ib [ia] IIC T4

The EC declarations of conformity are kept on file at the following address for the authorities in charge:

Siemens Aktiengesellschaft
Automation and Drives Division
A&D AS RD ST Type Test
Postfach 1963
D-92209 Amberg

Note

Electronics modules of device category 2G may be used in zone 1 hazardous areas. Sensors of device categories 1G, 2G and 3G may be connected to the intrinsically safe inputs of the electronics modules for zones 0, 1 and 2; sensors of device categories 1D, 2D and 3D may be used for zones 20, 21 and 22.

UL/CSA certification



See *Control Drawing* A5E00158421-01

FM certification



See *Control Drawing* A5E00158421-01

