

9.1.4 Electronics Block ET 200B-4AI (6ES7 134-0HF00-0XB0)

Characteristics

The ET 200B-4AI electronics block has the following features:

- 4 inputs, floating to the supply voltage of the internal logic
- Measuring ranges: ± 1.25 V, ± 2.5 V, ± 5 V, ± 10 V, 0 to 20 mA, 4 to 20 mA, ± 20 mA
- Measuring principle: successive approximation
- Supply voltage: 24 V DC
- Connectable sensors
 - Voltage sensors (2-wire connection)
 - Current sensors (2-wire connection)
- Measuring range set using COM ET 200

Dimension Drawing

See Figure 9-5 for the precise dimensions.

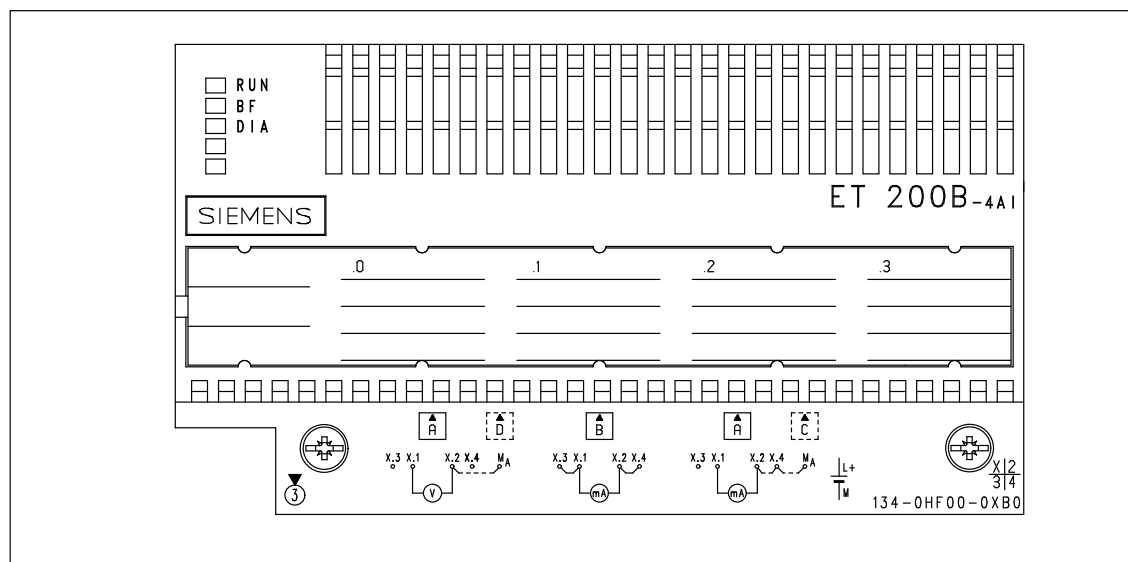


Figure 9-15 Front Elevation: ET 200B-4AI (6ES7 134-0HF00-0XB0)

Electronics Block ET 200B-4AI (6ES7 134-0HF00-0XB0), continued

Possible Connections

You can connect the following to the ET 200B-4AI:

- Up to 4 voltage sensors (2-wire connection)
- Up to 4 current sensors (2-wire connection)

Mixed connection of current and voltage sensors is possible.

Measuring Methods

You have the choice of two methods of measuring analog signals from current/voltage sensors:

- Floating-ground measurement
- Ground-referenced measurement

Floating-Ground Measurement

In the case of floating-ground measurement (differential measurement), each signal line has its own signal reference conductor.

Differential measurement is required in the following cases:

- If the sensors are connected to different potentials and
- If the different signal sources are physically apart.

Note

The maximum permissible common mode voltage (V_{CM}) of the differential inputs to analog ground (M_A) is ± 1 V.

The maximum permissible voltage difference between M_A and PE must not exceed 75 V DC/60 V AC.

Avoid ground loops!

Ground-Referenced Measurement

In the case of ground-referenced measurement, all signal reference conductors in the TB8 are connected to a common reference point (analog ground M_A).

To avoid ground loops, galvanically isolated and ungrounded signal sources (thermocouples, Pt 100, voltage sources) are required.

Note

Connect M_A to PE() to enhance noise immunity in the case of ground-referenced measurement.

Electronics Block ET 200B-4AI (6ES7 134-0HF00-0XB0), continued

Parameterization You can define the functional principle of the ET 200B-4AI with the COM ET 200 parameterization software.

Table 9-15 shows all the parameters for the ET 200B-4AI:

Table 9-15 Parameter für ET 200B-4AI

Byte ¹	Parameter	Explanation	Value Range
3 (Bit 0)	Diagnostic enable for channel 0 (terminals 0.1/0.2)	Diagnostics messages enabled separately for each channel	Disable Enable
3 (Bit 1)	Diagnostic enable for channel 1 (terminals 1.1/1.2)		
3 (Bit 2)	Diagnostic enable for channel 2 (terminals 2.1/2.2)		
3 (Bit 3)	Diagnostic enable for channel 3 (terminals 3.1/3.2)		
7	Measurement method and range for channel 0 (terminals 0.1/0.2)	You can set the measurement method and range separately for each channel. For voltage measurement: For current measurement:	± 10 V ± 5 V ± 2,5 V ± 1,25 mV ± 20 mA 0 to 20 mA 4 to 20 mA
8	Measurement method and range for channel 1 (terminals 1.1/1.2)		
9	Measurement method and range for channel 2 (terminals 2.1/2.2)		
10	Measurement method and range for channel 3 (terminals 3.1/3.2)		
23	Representation of measured values		Two's complement Amount with sign Binary

 : Default setting in parameterization frame

¹ Byte address in parameterization frame of slave

Where to Find a Description

Parameterization of the ET 200B-4AI with COM ET 200 V 4.x is described in detail in Section 4.2.

COM ET 200 WINDOWS also provides extensive support for parameterizing the ET 200B-4AI with COM ET 200 WINDOWS through its integrated help system.

Please refer to the *ET 200 Distributed I/O System* manual (Order No. 6ES5 998-3ES12) for further information about how to use COM ET 200 WINDOWS.

Schematic Circuit Diagram

Simplified representation of potential for the ET 200B-4AI and TB8:

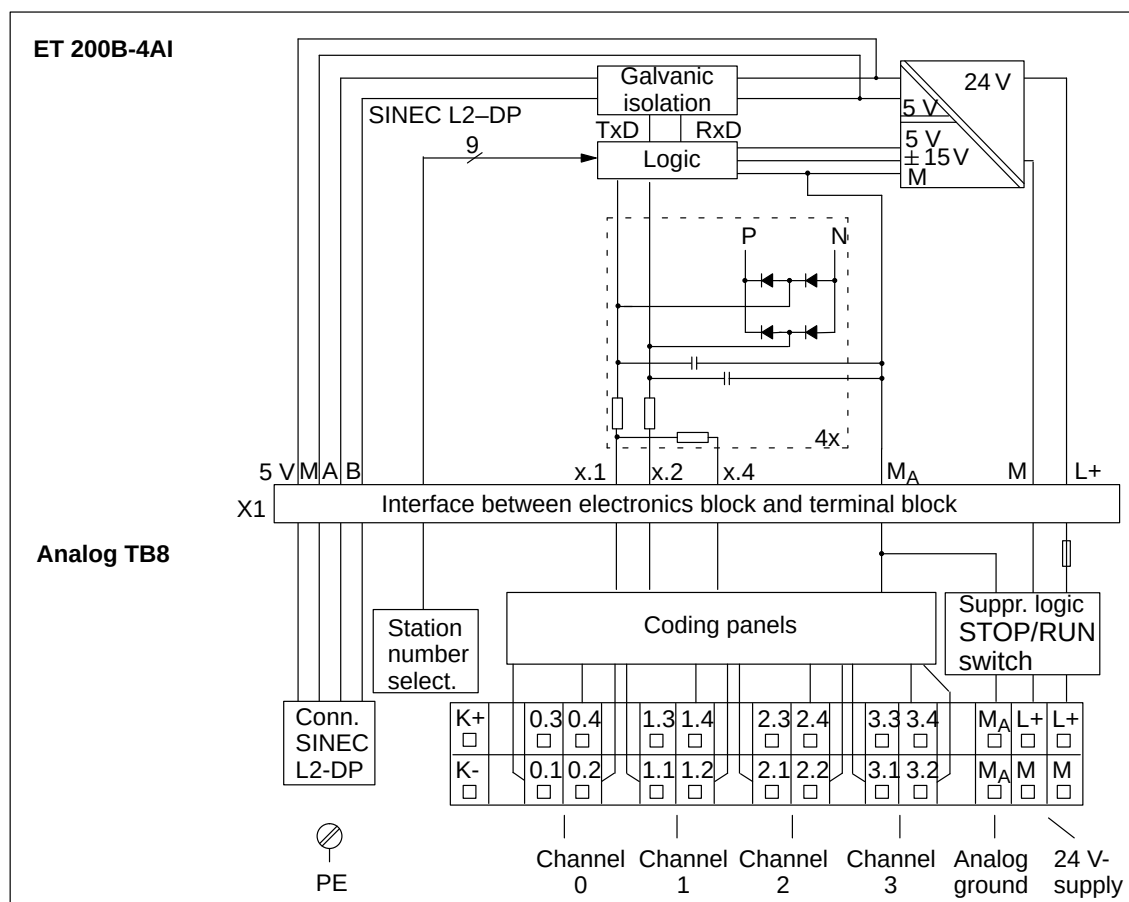


Figure 9-20 Schematic Circuit Diagram: ET 200B-4AI (6ES7 134-0HF00-0XB0) and TB8

Technical specifications	
Baud rates	9.6/19.2/93.75/187.5/500/1500 kbps
Bus protocol	DP Standard
Galvanic isolation to SINEC L2-DP bus	Yes
Power losses	Typ. 1.8 W
Weight (EB and TB)	Approx. 550 g (19.25 oz.)
Dimensions (EB and TB: W x H x D)	160 x 130 x 60 mm (6.24 x 5.07 x 2.34 in.)
Diagnostics functions	
Voltage monitoring	Green "RUN" LED
Bus monitoring SINEC L2-DP	Red "BF" LED
Group diagnostics	Red "DIA" LED, parameterizable
Supply voltage for inputs and internal logic	
Supply voltage (L+)	
• Rated value	24 V DC
• Permissible range	18.5 to 30.2 V
• Value for $t < 0.5s$	35 V
Current consumption from L+	
• Logic	70 mA
Inputs	
Number of inputs	4
Galvanic isolation to internal electronic circuits	No
Galvanic isolation to voltage supply of internal logic	Yes
Measured value ranges	
• Voltage sensors	$\pm 1.25\text{ V}$, $\pm 2.5\text{ V}$, $\pm 5\text{ V}$, $\pm 10\text{ V}$
• Current sensors	0 to 20 mA, 4 to 20 mA, $\pm 20\text{ mA}$
Method of connecting signal sensors	2-wire connection
Input resistance	
• Voltage measurement	$\geq 100\text{ k}\Omega$
• Current measurement	125 Ω
Inputs, continued	
Measured value representation	Can be switched between following data formats: 12-bit two's complement, 11-bit amount with sign, 12-bit binary
Measuring principle	Successive approximation
Conversion time	Max. 100 μs
Module cycle time	Approx. 2 ms
Permissible potential difference	
• Inputs to each other	Max. $\pm 10\text{ V}$
• Inputs to M_A (V_{CM})	Max. $\pm 1\text{ V}$
• M_A to PE or M	Max. 75 V DC/60 V AC
Fault message in event of	
• Overrange	Yes
• Wire break of signal sensor lines	No
Noise suppression for $f = n \times (50/60\text{ Hz} \pm 1\%)$ $n = 1, 2, \dots$	
• Common mode noise ($V_{PP} < 1\text{ V}$)	Min. 70 dB
Basic error limit	
• Voltage ranges	0.15 %
• Current range	0.20 %
Working error limit (0 to 60 °C) (32 to 140 °F)	
• Voltage ranges	0.32 %
• Current range	0.41 %
Permissible input voltage (destruction limit)	Max. $\pm 30\text{ V}$ (static) or $\pm 75\text{ V}$ (pulse for max. 1 ms and mark-space ratio 1:20)
Permissible input current (destruction limit)	Max. 40 mA
Cable length	
• Shielded	Max. 100 m (328 ft.)