## **SIEMENS**

## **Data sheet**



SIMATIC ET 200SP, analog input module, AI Energy Meter CT HF, for 1A or 5A current transformer, with network analysis functions, suitable for BU type U0, channel diagnostics

General information	
Product type designation	Al Energy Meter CT HF
Firmware version	V8.0
FW update possible	Yes
usable BaseUnits	BU type U0
Color code for module-specific color identification plate	CC20
Supported power supply systems	TT, TN, IT
Product function	
<ul> <li>Voltage measurement</li> </ul>	Yes
<ul> <li>— without voltage transformer</li> </ul>	Yes
<ul> <li>— with voltage transformer</li> </ul>	Yes
Current measurement	Yes; Max. 4
<ul> <li>— without current transformer</li> </ul>	No
<ul> <li>— with current transformer</li> </ul>	Yes; 1 A or 5 A current transformer
— With Rogowski coil	No
<ul> <li>With current-voltage-converter</li> </ul>	No
Energy measurement	Yes
<ul> <li>Frequency measurement</li> </ul>	Yes
<ul> <li>Power measurement</li> </ul>	Yes
<ul> <li>Active power measurement</li> </ul>	Yes
<ul> <li>Reactive power measurement</li> </ul>	Yes
<ul> <li>Power factor measurement</li> </ul>	Yes
<ul> <li>Active factor measurement</li> </ul>	Yes
<ul> <li>Reactive power compensation</li> </ul>	Yes
Line analysis	Yes
<ul> <li>Monitoring of instantaneous and half-wave values</li> </ul>	Yes
<ul> <li>THD measurement for current and voltage</li> </ul>	Yes
<ul> <li>Harmonics for current and voltage</li> </ul>	Yes
— Voltage dip (DIP)	Yes
— Voltage swell	Yes
• I&M data	Yes; I&M0 to I&M3
Isochronous mode	No
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	STEP 7 V16 or higher with HSP
<ul> <li>STEP 7 configurable/integrated from version</li> </ul>	V5.5 SP3 or higher
<ul> <li>PROFIBUS from GSD version/GSD revision</li> </ul>	One GSD file each, Revision 3 and 5 and higher
<ul> <li>PROFINET from GSD version/GSD revision</li> </ul>	V2.3
Operating mode	
Switching between operating modes in RUN	Yes; For module version 32 I/20 Q, it is possible to dynamically switch betwee 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user

Cyclic measured value access  A cyclic measured value access  Fixed measured value sets  Freely definable measured value sets  Pes  Reparameterization possible in RUN  Reparameterization possible in RUN  Ves  Calibration possible in RUN  Mounting position  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible
Fixed measured value sets Freely definable measured value access  Cit - Configuration in RUN Reparameterization possible in RUN Yes Calibration possible in RUN Mounting position Mounting position Bany Supply voitage Rated value (DC) Permissible range, lower limit (DC) Permissible range, upper limit (DC) Permissi
Freely definable measured value sets  Cit Configuration in RUN  Reparameterization possible in RUN  Installation type/mounting  Mounting position  Supply voitage  Rated value (DC)  permissible range, lower limit (DC)  permissible ra
Cite Configuration in RUN Reparameterization possible in RUN Reparameterization possible in RUN Yes  (Calibration possible in RUN) Rounting position Mounting position Rated value (DC) Reparameterization possible in RUN  Permissible range, lower limit (DC) Permissible range, upper l
Reparameterization possible in RUN  Calibration possible in RUN  Yes  Installation type/mounting  Mounting position  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, lower limit (DC)  permissible range, uper limit (DC)  permissible range, up
Calibration possible in RUN Installation type/mounting Mounting position Rated value (DC) Rated value (DC) Permissible range, lower limit
Mounting position   any
Mounting position any Supply voltage Rated value (DC)
Rated value (DC) 24 V permissible range, lower limit (DC) 28.8 V  Input current Current consumption (rated value) 12.5 mA Current consumption, max. 17 mA  Power loss. Power loss, typ. 1.4 W: 4x 6 A input current, 3x 230 V AC  Address space per module Inputs 256 byte Outputs 20 byte  Hardware configuration  Automatic encoding Mechanical coding element Yes Selection of BaseUnit for connection variants 2-2 wire connection BU type C  Selection of BaseUnit for connection variants 2-2 wire connection BU type U0  Time of day Operating hours counter Persent Yes  Analog Inputs  Cycle time (all channels), typ. 50 ms, Time for consistent update of all measured and calculated values (cyclic und acyclic data)  Cable length Shielded, max 200 m  Analog value generation for the inputs  Sampling frequency, max. 2048 kHz  Interrupts (diagnostics/status information  Alarms Diagnoses
Rated value (DC) 94 V permissible range, lower limit (DC) 19.2 V permissible range, upper limit (DC) 28.8 V Input current  Current consumption (rated value) 12.5 mA Current consumption (rated value) 17 mA  Power loss  Power loss, typ. 1.4 W; 4x 6 A input current, 3x 230 V AC  Address area Address space per module  Inputs 256 byte Outputs 20 byte  Automatic encoding Yes Mechanical coding element Yes Type of mechanical coding element Yes Selection of BaseUnit for connection variants 2-wire connection  BU type U0  Time of day  Operating hours counter  present Yes  Analog inputs  Cycle time (all channels), typ. 50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)  Cable length Shelded, max. 200 m unshielded, max. 200 m Sampling frequency, max. 2 048 kHz  Interrupts/diagnostics/status information  Alams Diagnoses  Diagnoses
permissible range, lower limit (DC) 28.8 V permissible range, upper limit (DC) 28.8 V Input current Current consumption (rated value) 12.5 mA Current consumption, max. 17 mA Power loss Power loss V Power loss, typ. 1.4 W; 4x 6 A input current, 3x 230 V AC Address area Address space per module Inputs 256 byte Outputs 20 byte Hardware configuration Automatic encoding Yes Mechanical coding element Yes Imput Connection variants Intervet Connection Variants Intervet Connection Variants
permissible range, upper limit (DC) Input current  Current consumption (rated value)  Current consumption, max.  17 mA  Power loss  Power loss, typ.  Addross area  Address space per module  Inputs  Outputs  Outputs  Outputs  Automatic encoding  Yes  Mechanical coding element  Type C  Selection of BaseUnit for connection variants  2-wire connection  BU type U0  Time of day  Operating hours counter  Present  Analog inputs  Cycle time (all channels), typ.  Cable length  shelded, max.  unshelded, max.  200 m  Analog value generation for the inputs  Sampling requency, max.  Diagnostic alarm  Pyes  Diagnoses  Diagnoses
Input current Current consumption (rated value) Current consumption, max. 17 mA  Power loss Power loss, typ. 1.4 W; 4x 6 A input current, 3x 230 V AC  Address area  Address space per module Inputs Inputs Outputs 256 byte Outputs 20 byte  Hardware configuration  Automatic encoding Mechanical coding element Yes Type of mechanical coding element Ves Veye C  Selection of BaseUnit for connection variants Verent of day  Operating hours counter  present Yes  Cycle time (all channels), typ.  Cable length Shielded, max. Under the company of the inputs  Sampling frequency, max. Sampling frequency, max.  Diagnostic alarm Limit value alarm Pes Power loss, typ. 17 mA 18 mA Power loss, typ. 18 my; 4x 6 A input current, 3x 230 V AC  Address area  19 my; 4x 6 A input current, 3x 230 V AC  Adainputs  Ves  Selection of BaseUnit for configuration  19 pc C  Selection of BaseUnit for connection variants  Yes  Ves  Analog value generation for the inputs  Sampling frequency, max.  Polagnostic alarm Limit value alarm Pes Limit value alarm Pes Limit value alarm Pes Limit value alarm Pes Polagnoses
Current consumption (rated value)  Current consumption, max.  Power loss  Power loss, typ.  Address area  Address space per module  Inputs Outputs Outputs  Automatic encoding Mechanical coding element Type of mechanical coding element Operating hours counter  Present Operating hours counter  Present Oye time (all channels), typ.  Cable length Shelded, max. Oya max. Oya max.  Oya max.  Diagnostic alarm Diagnoses  Power loss, typ.  1.4 W; 4x 6 A input current, 3x 230 V AC  Address area  Address space per module  1.4 W; 4x 6 A input current, 3x 230 V AC  Alay to A input current, 3x 230 V AC  Address area  Address area  Address area  Address space per module  Pres  Pr
Current consumption, max. 17 mA  Power loss Power loss, typ. 1.4 W; 4x 6 A input current, 3x 230 V AC  Address area  Address space per module  Inputs 256 byte Outputs 20 byte  Hardware configuration  Automatic encoding Yes Mechanical coding element Yes Type of mechanical coding element by Calentin of But type C  Selection of BaseUnit for connection variants  2-wire connection But type U0  Time of day Operating hours counter  present Yes  Analog inputs  Cycle time (all channels), typ. 50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)  Cable length shielded, max. 200 m  analog value generation for the inputs  Sampling frequency, max. 2 048 kHz  Interrupts/diagnostics/status information  Alaims  Diagnoses
Power loss, typ.  Address area  Address space per module  Inputs Outputs Outputs Address configuration  Automatic encoding Mechanical coding element Type of mechanical coding element Operating hours counter  present Analog inputs  Cycle time (all channels), typ.  Cable length  shielded, max. Unshielded, max. Unshielded, max. Unshielded, max. Diagnostic alarm Alarms  Diagnoses  Power loss, typ.  1.4 W; 4x 6 A input current, 3x 230 V AC  Alay (A input current, 3x 230 V AC  Address area  Address space per module  Pres  Yes  Bu type U  Operating hours counter  Pres  Pres  Analog inputs  Cycle time (all channels), typ.  So ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)  Cable length  Analog value generation for the inputs  Sampling frequency, max.  Diagnostic alarm Pres  Pre
Power loss, typ.  Address area Address space per module  Inputs Outputs Output
Address space per module  Inputs Outputs Outputs 256 byte Outputs  Automatic encoding Mechanical coding element Yes Type of mechanical coding element Uppe C Selection of BaseUnit for connection variants Personal Selection of Bull type U0  Time of day  Operating hours counter Present Personal Yes  Cycle time (all channels), typ. So ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)  Cable length Selected, max. Punchieded, m
Address space per module  Inputs Outputs Outpu
Inputs Outputs Outputs Outputs Outputs Outputs  Automatic encoding  Mechanical coding element Outputs Outputs Outputs Outputs  Nechanical coding element Outputs Outp
Inputs Outputs Outputs Outputs Outputs Outputs  Automatic encoding  Mechanical coding element Outputs Outputs Outputs Outputs  Nechanical coding element Outputs Outp
Outputs 20 byte  Hardware configuration  Automatic encoding Yes     Mechanical coding element Yes     Type of mechanical coding element type C  Selection of BaseUnit for connection variants     • 2-wire connection BU type U0  Time of day  Operating hours counter     • present Yes  Analog inputs  Cycle time (all channels), typ. 50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)  Cable length     • shielded, max. 200 m     • unshielded, max. 200 m  Analog value generation for the inputs  Sampling frequency, max. 2 048 kHz  Interrupts/diagnostics/status information  Alarms  • Diagnostic alarm Yes     • Hardware interrupt Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)  Diagnoses
Automatic encoding  • Mechanical coding element  • Type of mechanical coding element  • Type of mechanical coding element  • Type of mechanical coding element  • Type C  Selection of BaseUnit for connection variants  • 2-wire connection  BU type U0  Time of day  Operating hours counter  • present  Yes  Analog inputs  Cycle time (all channels), typ.  50 ms; Time for consistent update of all measured and calculated values (cyclic und acyclic data)  Cable length  • shielded, max.  • unshielded, max.  • unshielded, max.  200 m  Analog value generation for the inputs  Sampling frequency, max.  Interrupts/diagnostics/status information  Alarms  • Diagnostic alarm  • Diagnostic alarm  • Hardware interrupt  Diagnoses
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Mechanical coding element Type of mechanical coding element Type C  Selection of BaseUnit for connection variants  2-wire connection BU type U0  Time of day  Operating hours counter  present  Analog inputs  Cycle time (all channels), typ.  Cable length shielded, max. unshielded, max.  unshielded, max. 200 m  Analog value generation for the inputs  Sampling frequency, max.  Interrupts/diagnostics/status information  Alarms  Diagnostic alarm Hardware interrupt  Pes  Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)  Diagnoses
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und acyclic data)  Cable length  shielded, max. unshielded, max. 200 m  Analog value generation for the inputs  Sampling frequency, max. 2 048 kHz  Interrupts/diagnostics/status information  Alarms  Diagnostic alarm Limit value alarm Hardware interrupt  Yes Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)
<ul> <li>shielded, max.</li> <li>unshielded, max.</li> <li>200 m</li> </ul> Analog value generation for the inputs Sampling frequency, max. Interrupts/diagnostics/status information Alarms <ul> <li>Diagnostic alarm</li> <li>Limit value alarm</li> <li>Hardware interrupt</li> </ul> Ves <ul> <li>Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)</li> </ul> Diagnoses
<ul> <li>unshielded, max.</li> <li>Analog value generation for the inputs</li> <li>Sampling frequency, max.</li> <li>2 048 kHz</li> <li>Interrupts/diagnostics/status information</li> <li>Alarms         <ul> <li>Diagnostic alarm</li> <li>Limit value alarm</li> <li>Hardware interrupt</li> </ul> </li> <li>Diagnoses</li> <li>Diagnoses</li> </ul>
Analog value generation for the inputs  Sampling frequency, max.  Interrupts/diagnostics/status information  Alarms  • Diagnostic alarm  • Limit value alarm  • Hardware interrupt  Diagnoses  Analog value generation for the inputs  2 048 kHz  Yes  Yes  Yes  Yes  Yes  Yes  Yes  Ye
Sampling frequency, max.  Interrupts/diagnostics/status information  Alarms  • Diagnostic alarm • Limit value alarm • Hardware interrupt  Diagnoses  2 048 kHz  Yes  Yes  Yes  Yes  Yes  Yes  Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)
Interrupts/diagnostics/status information  Alarms  • Diagnostic alarm • Limit value alarm • Hardware interrupt  Piagnoses  Piagnoses
Alarms
<ul> <li>Diagnostic alarm</li> <li>Limit value alarm</li> <li>Hardware interrupt</li> <li>Yes</li> <li>Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)</li> </ul> Diagnoses
<ul> <li>Limit value alarm</li> <li>Hardware interrupt</li> <li>Diagnoses</li> <li>Yes</li> <li>Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)</li> </ul>
<ul> <li>Hardware interrupt</li> <li>Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)</li> </ul> Diagnoses
undershooting of value)  Diagnoses
Diagnoses
● Line quality Yes
Supply voltage     Yes
Hardware interrupt lost     Yes
Parameter assignment error     Yes
Module fault     Yes
Channel not available  Yes
Overflow/underflow     Yes
Overload current     Yes
Diagnostics indication LED
Monitoring of the supply voltage (PWR-LED)     Yes
Channel status display  Yes; green LED
• for channel diagnostics  Yes; red Fn LED
for module diagnostics     Yes; green/red DIAG LED
Integrated Functions



**TRMS** • Measuring procedure for voltage measurement Measuring procedure for current measurement **TRMS** • Type of measured value acquisition seamless · Curve shape of voltage Sinusoidal or distorted Yes • Buffering of measured variables Parameter length 128 byte • Bandwidth of measured value acquisition 3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz Measuring range - Frequency measurement, min. 40 Hz 70 Hz - Frequency measurement, max. Measuring inputs for voltage - Measurable line voltage between phase and neutral 277 V conductor - Measurable line voltage between the line 480 V - Measurable line voltage between phase and neutral 3 V conductor, min. - Measurable line voltage between phase and neutral 300 V conductor, max. - Measurable line voltage between the line 6 V conductors, min. - Measurable line voltage between the line 519 V conductors, max. - Internal resistance line conductor and neutral 1.5 MΩ conductor - Power consumption per phase 60 mW; 300 V AC - Impulse voltage resistance 1,2/50µs 2.5 kV - Measurement category for voltage measurement in CAT II accordance with IEC 61010-2-030 Measuring inputs for current 1 %; Relative to measuring range; 1 A, 5 A - measurable relative current (AC), min. - measurable relative current (AC), max. 120 %; Relative to the secondary rated current 5 A - Continuous current with AC, maximum permissible 5 A; 6 A permanent thermal overload 0.6 VA Apparent power consumption per phase for measuring range 5 A - Rated value short-time withstand current restricted 100 A to 1 s - Input resistance measuring range 0 to 5 A 25 mO: At the terminal - Surge strength 10 A: for 1 minute — Zero point suppression 0 ... 20%, referred to the nominal current Accuracy class according to IEC 61557-12 - Measured variable voltage 0,2 0,2 - Measured variable current - Measured variable apparent power 0.5 0.5 - Measured variable active power - Measured variable reactive power 1 0.5 - Measured variable power factor - Measured variable active energy 0.5 - Measured variable reactive energy 1 - Measured variable neutral current 0.2 - Measured variable phase angle  $\pm 0.5$ °; not covered by IEC 61557-12 0.05; only valid for the permissible voltage measuring range - Measured variable frequency - Measured variable harmonic 1 - Measured variable THDU 1 Measured variable THDI 1 Accuracy class line analysis acc. to IEC 61000-4-30 - Measured variable voltage Class S - Measured variable current Class S - Measured variable frequency Class S - Measured variable voltage interruption Class S - Measured variable voltage dip and swell Class S - Measured variable harmonic voltage Class S - Measured variable harmonic current Class S Potential separation



Potential separation channels	
<ul> <li>between the channels</li> </ul>	No
<ul> <li>between the channels and backplane bus</li> </ul>	Yes
<ul> <li>Between the channels and load voltage L+</li> </ul>	Yes; Including FE
Isolation	
Isolation tested with	Between channels and backplane bus, 24 V supply: Routine test, 1 920 V AC, 2 s; between backplane bus and 24 V supply: Type test, 707 V DC
Ambient conditions	
Ambient temperature during operation	
<ul> <li>horizontal installation, min.</li> </ul>	-30 °C
<ul> <li>horizontal installation, max.</li> </ul>	60 °C
<ul> <li>vertical installation, min.</li> </ul>	-30 °C
vertical installation, max.	50 °C
Altitude during operation relating to sea level	
<ul> <li>Installation altitude above sea level, max.</li> </ul>	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g
Other	
Data for selecting a voltage transformer	
<ul> <li>Secondary side, max.</li> </ul>	300 V
Data for selecting a current transformer	
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual
<ul> <li>Burden power current transformer x/5A, min.</li> </ul>	As a function of cable length and cross section, see device manual

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