

SIPLUS S7-1500 TM PosInput 2 based on 6ES7551-1AB01-0AB0 with conformal coating -40...+70 °C . counter and position detection module for RS-422 incremental encoder or SSI absolute encoder, 2 channels, 2 DI, 2 DQ per channel

General information	
Product type designation	TM PosInput 2
Firmware version	V2.0
<ul style="list-style-type: none"> <li>FW update possible</li> </ul>	Yes
based on	<a href="#">6ES7551-1AB01-0AB0</a>
Number of channels	2
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>	Yes
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V17
<ul style="list-style-type: none"> <li>PROFIBUS from GSD version/GSD revision</li> </ul>	GSD Revision 5
<ul style="list-style-type: none"> <li>PROFINET from GSD version/GSD revision</li> </ul>	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>permissible range, lower limit (DC)</li> </ul>	19.2 V
<ul style="list-style-type: none"> <li>permissible range, upper limit (DC)</li> </ul>	28.8 V
<ul style="list-style-type: none"> <li>Reverse polarity protection</li> </ul>	Yes
Input current	
Current consumption, max.	75 mA; without load
Encoder supply	
Number of outputs	4; One 5V and 24V encoder supply per channel
5 V encoder supply	
<ul style="list-style-type: none"> <li>5 V</li> </ul>	Yes; 5.2 V ±2 %
<ul style="list-style-type: none"> <li>Short-circuit protection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Output current, max.</li> </ul>	300 mA; Per channel
24 V encoder supply	
<ul style="list-style-type: none"> <li>24 V</li> </ul>	Yes; L+ (-0.8 V)
<ul style="list-style-type: none"> <li>Short-circuit protection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Output current, max.</li> </ul>	300 mA; Per channel
Power	
Power available from the backplane bus	1.3 W
Power loss	
Power loss, typ.	5.5 W
Address area	
Address space per module	
<ul style="list-style-type: none"> <li>Inputs</li> </ul>	32 byte; 16 bytes per channel; 4 bytes for fast mode
<ul style="list-style-type: none"> <li>Outputs</li> </ul>	24 byte; 12 bytes per channel; 4 bytes for Motion Control, 0 bytes for fast mode
Digital inputs	
Number of digital inputs	4; 2 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
<ul style="list-style-type: none"> <li>Gate start/stop</li> </ul>	Yes; only for pulse and incremental encoders
<ul style="list-style-type: none"> <li>Capture</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Synchronization</li> </ul>	Yes; only for pulse and incremental encoders

• Freely usable digital input	Yes
<b>Input voltage</b>	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
<b>Input current</b>	
• for signal "1", typ.	2.5 mA
<b>Input delay (for rated value of input voltage)</b>	
for standard inputs	
— parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
— at "0" to "1", min.	6 µs; for parameterization "none"
— at "1" to "0", min.	6 µs; for parameterization "none"
for technological functions	
— parameterizable	Yes
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Digital outputs</b>	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
<b>Digital output functions, parameterizable</b>	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	12 kΩ
<b>Output voltage</b>	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
<b>Output current</b>	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "1" permissible range, max.	0.6 A; Per digital output
• for signal "1" minimum load current	2 mA
• for signal "0" residual current, max.	0.5 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
<b>Switching frequency</b>	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
<b>Total current of the outputs</b>	
• Current per module, max.	2 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Encoder</b>	
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz

<ul style="list-style-type: none"> <li>Counting frequency, max.</li> <li>Cable length, shielded, max.</li> <li>Signal filter, parameterizable</li> <li>Incremental encoder with A/B tracks, 90° phase offset</li> <li>Incremental encoder with A/B tracks, 90° phase offset and zero track</li> <li>pulse encoder</li> <li>Pulse encoder with direction</li> <li>pulse encoder with one impulse signal per count direction</li> </ul>	<p>4 MHz; with quadruple evaluation</p> <p>32 m; at 1 MHz</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
<b>Encoder signals, incremental encoder (asymmetrical)</b>	
<ul style="list-style-type: none"> <li>Input voltage</li> <li>Input frequency, max.</li> <li>Counting frequency, max.</li> <li>Signal filter, parameterizable</li> <li>Incremental encoder with A/B tracks, 90° phase offset</li> <li>Incremental encoder with A/B tracks, 90° phase offset and zero track</li> <li>pulse encoder</li> <li>pulse encoder with direction</li> <li>pulse encoder with one impulse signal per count direction</li> </ul>	<p>5 V TTL (push-pull encoders only)</p> <p>1 MHz</p> <p>4 MHz; with quadruple evaluation</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
<b>Encoder signals, absolute encoder (SSI)</b>	
<ul style="list-style-type: none"> <li>Input signal</li> <li>Telegram length, parameterizable</li> <li>Clock frequency, max.</li> <li>Binary code</li> <li>Gray code</li> <li>Cable length, shielded, max.</li> <li>Parity bit, parameterizable</li> <li>Monoflop time</li> <li>Multiturn</li> <li>Singleturn</li> </ul>	<p>to RS-422</p> <p>10 ... 40 bit</p> <p>2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz</p> <p>Yes</p> <p>Yes</p> <p>320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.</p> <p>Yes</p> <p>16, 32, 48, 64 <math>\mu</math>s &amp; automatic</p> <p>Yes</p> <p>Yes</p>
<b>Interface types</b>	
<ul style="list-style-type: none"> <li>TTL 5 V</li> <li>RS 422</li> </ul>	<p>Yes; push-pull encoders only</p> <p>Yes</p>
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> <li>Hardware interrupt</li> </ul>	<p>Yes</p> <p>Yes</p>
<b>Diagnoses</b>	
<ul style="list-style-type: none"> <li>Monitoring the supply voltage</li> <li>Wire-break</li> <li>Short-circuit</li> <li>A/B transition error at incremental encoder</li> <li>Telegram error at SSI encoder</li> </ul>	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
<b>Diagnostics indication LED</b>	
<ul style="list-style-type: none"> <li>RUN LED</li> <li>ERROR LED</li> <li>MAINT LED</li> <li>Monitoring of the supply voltage (PWR-LED)</li> <li>Channel status display</li> <li>for channel diagnostics</li> </ul>	<p>Yes; green LED</p> <p>Yes; red LED</p> <p>Yes; Yellow LED</p> <p>Yes; green LED</p> <p>Yes; green LED</p> <p>Yes; red LED</p>
<b>Integrated Functions</b>	
Counter	Yes
<ul style="list-style-type: none"> <li>Number of counters</li> <li>Counting frequency, max.</li> </ul>	<p>2</p> <p>4 MHz; with quadruple evaluation</p>
Fast mode	Yes
<b>Counting functions</b>	
<ul style="list-style-type: none"> <li>Can be used with TO High_Speed_Counter</li> <li>Continuous counting</li> </ul>	<p>Yes; only for pulse and incremental encoders</p> <p>Yes</p>

• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
<b>Comparator</b>	
— Number of comparators	2; Per channel
— Direction dependency	Yes
— Can be changed from user program	Yes
<b>Position detection</b>	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
<b>Measuring functions</b>	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
<b>Measuring range</b>	
— Frequency measurement, min.	0.04 Hz
— Frequency measurement, max.	4 MHz
— Cycle duration measurement, min.	0.25 µs
— Cycle duration measurement, max.	25 s
<b>Accuracy</b>	
— Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
— Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
— Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	No
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; Please note derating for inductive loads
• vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• vertical installation, max.	40 °C; Please note derating for inductive loads
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
<b>Relative humidity</b>	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
— Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
— to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
<b>Use on ships/at sea</b>	

— to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
— to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
— Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
— Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
<b>Decentralized operation</b>	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
<b>Dimensions</b>	
Width	35 mm
Height	147 mm
Depth	129 mm
<b>Weights</b>	
Weight, approx.	325 g

**last modified:**

5/29/2024 