

SIEMENS

SIMATIC

PG/PC - PROFIBUS PC Adapter USB A2

Operating Instructions

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Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
indicates that property damage can result if proper precautions are not taken.


If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

 WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Preface

What the consignment contains

The following components are supplied with the PC Adapter USB A2:

- PC Adapter USB A2 (article number: 6GK1571-0BA00-0AA0)
- USB cable (5 m)
- MPI cable (0.3 m)

With the MPI cable, you can connect the PC Adapter USB A2 to MPI networks, homogeneous PPI networks or to PROFIBUS networks.

Please check that the consignment you have received is complete. If the consignment is incomplete, contact your supplier or your local Siemens office.

Validity of this documentation

These operating instructions are valid for the following product:

- PC Adapter USB A2 (article number: 6GK1571-0BA00-0AA0)

Note

The PC Adapter USB A2 (article number: 6GK1571-0BA00-0AA0) replaces the PC Adapter USB (article number: 6ES7972-0CB20-0XA0).

Content of this documentation

These operating instructions contain information on the commissioning and use of the PC Adapter USB A2.

Required basic experience

To understand the operating instructions, you require general knowledge of automation engineering.

You also need to be familiar with using computers or tools similar to PCs (for example programming devices) with the Microsoft Windows operating system.

Updated operating instructions on the Internet

You will find the current version of these operating instructions on the Product Support pages under the following entry ID:

68849363 (<https://support.industry.siemens.com/cs/ww/en/view/68849363>)

Further documentation

- System manual PROFIBUS network manual
In this document, you will find detailed information on setting up a PROFIBUS network:
(<https://support.industry.siemens.com/cs/us/en/view/35222591>)
- SIMATIC NET documentation
You will find the entire SIMATIC NET documentation on the pages of Product Support:
(<https://support.industry.siemens.com/cs/ww/en/ps/15683/man>)

Further support

If you have questions on the use of the products described in the manual and you do not find the answers here, ask your Siemens contact in the Siemens agency or office responsible for you. You will find your contacts at:

(https://www.automation.siemens.com/aspa_app?ci=yes&lang=en)

You will find the links to the available technical documentation for the individual SIMATIC products and systems at:

(<https://support.industry.siemens.com/cs/us/en/view/109742705>)

The online catalog and online ordering system can be found at:

(<https://mall.industry.siemens.com/goos/WelcomePage.aspx?regionUrl=/&language=en>)

Trademarks

The following and possibly other names not identified by the registered trademark sign ® are registered trademarks of Siemens AG:

HARDNET, SOFTNET, CP 5612, CP 5613, CP 5614, CP 5622

Industry Online Support

In addition to the product documentation, the comprehensive online information platform of Siemens Industry Online Support offers support at the following Internet address:

(<https://support.industry.siemens.com/cs/us/en/>)

Apart from news, there you will also find:

- Project information: Manuals, FAQs, downloads, application examples etc.
- Contacts, Technical Forum
- The option submitting a support query: (<https://support.industry.siemens.com/My/us/en/>)
- Our service offer:

Right across our products and systems, we provide numerous services that support you in every phase of the life of your machine or system - from planning and implementation to commissioning, through to maintenance and modernization.

You will find contact information on the Internet at the following address:

(https://www.automation.siemens.com/aspa_app/?ci=yes&lang=en)

SITRAIN - Training for Industry

The training offer includes more than 300 courses on basic topics, extended knowledge and special knowledge as well as advanced training for individual sectors - available at more than 130 locations. Courses can also be organized individually and held locally at your location.

You will find detailed information on the training curriculum and how to contact our customer consultants at the following Internet address:

SITRAIN (<https://new.siemens.com/global/en/products/services/digital-enterprise-services/training-services/sitrain/learning-event.html>)

Industrial Networks Education

Training and certification for Industrial Networks

In our Industrial Networks Education courses you'll learn to design and implement wired and wireless data networks and connect them to a corporate network. You will also receive instruction on how to secure, diagnose and optimize communication networks. Certification can also be offered to supplement almost all training courses.

(<https://www.siemens.com/industrial-networks-education>)

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines, and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions form one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. These systems, machines and components should only be connected to the enterprise network or the Internet if and only to the extent necessary and with appropriate security measures (firewalls and/or network segmentation) in place.

You can find more information on protective measures in the area of industrial security by visiting: (<https://www.siemens.com/industrialsecurity>).

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends performing product updates as soon as they are available and using only the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To ensure that you are always informed about product updates, subscribe to the Siemens Industrial Security RSS feed at: (<https://www.siemens.com/cert>)

Note on firmware/software support

Check regularly for new firmware/software versions or security updates and apply them. After the release of a new version, previous versions are no longer supported and are not maintained.

SIMATIC NET glossary

The SIMATIC NET glossary describes terms that may be used in this document.

You will find the SIMATIC NET glossary in the Siemens Industry Online Support at the following address: (<http://support.automation.siemens.com/WW/view/en/50305045>)

Decommissioning

Shut down the device properly to prevent unauthorized persons from accessing confidential data in the device memory.

To do this, restore the factory settings on the device.

Recycling and disposal



The products are low in harmful substances, can be recycled and meet the requirements of the Directive 2012/19/EU for disposal of waste electrical and electronic equipment (WEEE).

Do not dispose of the products at public disposal sites.

For environmentally compliant recycling and disposal of your electronic waste, please contact a company certified for the disposal of electronic waste or your Siemens representative.

Note the different national regulations.

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Description of the device

1.1 Properties of the PC Adapter USB A2

The PC Adapter USB A2 can be operated on USB V1.1, V2.0 or V3.0 interfaces. The PC Adapter USB A2 supports the common energy-saving modes (for example hibernate mode).

Note

The PC Adapter USB A2 is compatible with its predecessor product "PC Adapter USB".

1.2 Function

The PC Adapter USB A2 connects a PC via a USB interface with the MPI/DP interface of an S7/M7/C7 system.

Since no internal slot is required for the connection, the PC Adapter USB A2 is also suitable for PCs that cannot be expanded (for example notebooks).

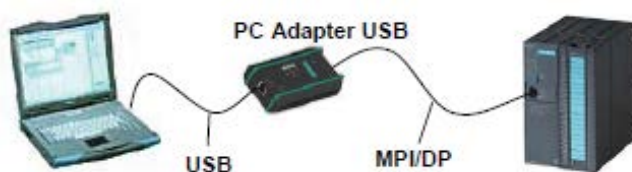


Figure 1-1 Configuration with PC Adapter USB A2

Note**Only one PC Adapter USB A2**

Only one PC Adapter USB A2 can be operated on a PC.

1.3 Characteristics

Characteristics

You can operate the PC Adapter USB A2 on MPI and PROFIBUS networks.

The following table shows which transmission speeds are supported by the PC Adapter USB A2 on which network type.

Table 1- 1 Bus profiles and transmission speeds

Transmission speed	MPI	PPI	PROFIBUS			
			DP	Standard	Universal	User defined
9.6 kbps	-	(✓)*	✓	✓	✓	✓
19.2 kbps	✓	(✓)*	✓	✓	✓	✓
45.45 kbps	-	-	✓	✓	-	✓
93.75 kbps	-	-	✓	✓	✓	✓
187.5 kbps	✓	(✓)*	✓	✓	✓	✓
500 kbps	-	-	✓	✓	✓	✓
1.5 Mbps	✓	-	✓	✓	✓	✓
3 Mbps	✓	-	✓	✓	-	✓
6 Mbps	✓	-	✓	✓	-	✓
12 Mbps	✓	-	✓	✓	-	✓

(✓)* The PPI bus profile can be used via the "Universal" PROFIBUS bus profile

Further features

- Automatic bus profile detection
- Up to 16 communications connections of which a maximum of 4 can be slaves (DP/T connections)
- Support of routing
- The PC Adapter USB A2 supports the following access to DP slaves:
 - Slave address assignment
 - Device diagnostics
 - Read/write data record

1.4 Ports

The PC Adapter USB A2 has the following connectors and displays:



1.5 Power supply

The PC Adapter USB A2 is supplied with power via the USB cable.

The PC Adapter USB A2 has electrical isolation between its MPI/DP and USB interface within a safety extra low voltage (SELV) circuit. It can therefore also be operated directly on ungrounded S7/M7/C7 systems.

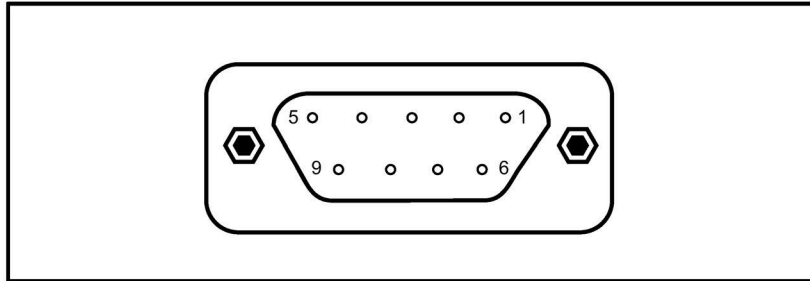
See also

Technical specifications (Page 23)

1.6 MPI/DP interface

Pin assignment

The MPI/DP socket has the following pin assignment:



Signal description

Pin no.	Short description	Meaning	Input/output
1	NC	not connected	-
2	NC	not connected	-
3	LTG_B	Data line B	Input and output
4	RTS_AS	RTSAS, control signal for received data stream. The signal is '1' active when the directly connected S7 automation system sends.	Input
5	M5V	Reference potential of the MPI/DP interface for the signals RTS_AS and RTS_PG	Output
6	P5V	+5 V (only for bus termination)	Output
7	NC	not connected	-
8	LTG_A	Data line A	Input and output
9	RTS_PG	RTS output signal of the PC Adapter USB A2. The signal is '1' when the PC Adapter USB A2 sends. The signal is not included in the 0.3 m MPI cable!	Output
Shield	-	on connector housing*	-

* The shield is connected through to the USB socket via the adapter electronics module.

1.7 USB interface

Interface assignment

USB socket from above:

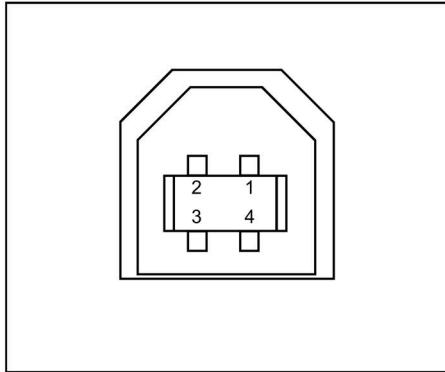


Figure 1-2 USB interface

Signal description

Pin no.	Signal	Meaning
1	+5V	Supply voltage
2	-Data	- differential signal
3	+Data	+ differential signal
4	Ground	Ground

Note

If several USB devices are being operated on the PC, this can impair the performance of the PC Adapter USB A2. To achieve optimum performance in the functions for communicating with the S7 automation system, remove all USB devices you do not require.

NOTICE

Disrupted function or communication abort possible

Removing and inserting USB devices can cause functional disruptions on the USB interface. In extreme situations, this can lead to the communication via the PC Adapter USB A2 being aborted meaning that the application needs to be restarted.

1.8 Meaning of the LED display

The LEDs on the PC Adapter USB A2 have the following meaning:

Designation	Color	Meaning
ACTIVITY	Green	<ul style="list-style-type: none"> • LED off: no application active • LED on: application active • LED flickers: Application active, PC Adapter USB A2 is in the token ring (bus activity) • LED flashing: Flashing function via the PG/PC panel active (twice per second)
FAULT	Red	<ul style="list-style-type: none"> • LED off: No disruptions • LED flashes fast (twice a second): serious internal problem • LED flashes rhythmically: Bus disruption
USB 5V	Green	<ul style="list-style-type: none"> • LED on: The PC Adapter USB A2 is ready for operation. • LED off: The 5 V supply voltage is not available. • LED flashes slowly: <ul style="list-style-type: none"> – The operating system is not active. – The PC Adapter USB A2 was "thrown out". – The PC Adapter USB A2 is disabled in the Windows hardware manager. – The power supply of the USB interface is inadequate to operate the PC Adapter USB A2.
All 3 LEDs are lit permanently	-	<p>Hardware defect: Replace the PC Adapter USB A2 and send the defective device to your Siemens contact.</p>

Software requirements

To work with the PC Adapter USB A2, you require a PC with one of the following installed software packages:

- STEP 7 as of V5.5 SP4
- SIMATIC STEP 7 Professional (TIA Portal) as of V12 SP1
- SIMATIC NET PC software as of V12

To operate the PC Adapter USB A2 on a PPI network, you also require the software package STEP 7 Micro/Win32.

Hardware installation

3.1 Hardware requirements

You will need a PC with a free USB port.

3.2 Connecting the PC Adapter USB A2

Connecting to the PC

1. Insert the supplied USB cable in a USB interface of your PC.
2. Insert the other end of the USB cable into the USB interface of the PC Adapter USB A2.

Connecting to the automation system

1. Insert the supplied MPI cable into the PC Adapter USB A2 and screw it tight.
2. Connect the other end of the MPI cable to the MPI/PG interface of your CPU and screw it tight.

Note

The PC Adapter USB A2 and the S7/M7/C7 system each represent a network node.

- In networks made up of 2 nodes (PC Adapter USB A2 and S7/M7/C7 system), the PC Adapter USB A2 is operated directly on the socket of the S7/M7/C7 system.
 - In networks made up of more than 2 nodes, the PC Adapter USB A2 is connected to the "PG socket" of a PROFIBUS connector (SINEC L2 bus connector). This does not require any change to the setting of the terminating resistors.
-

Connecting the PC Adapter USB A2 to the PROFIBUS network

A maximum of 32 nodes can be connected to a PROFIBUS network segment. Several network segments can be connected together using PROFIBUS repeaters to create a complete network with a maximum of 127 nodes. The transmission speed in the PROFIBUS network is a maximum of 12 Mbps.

The PC Adapter USB A2 supports transmission speeds up to a maximum of 12 Mbps.

NOTICE

Do not insert any extension cords

No extension cord may be inserted in the connection between the PC Adapter USB A2 and S7/M7/C7 system.

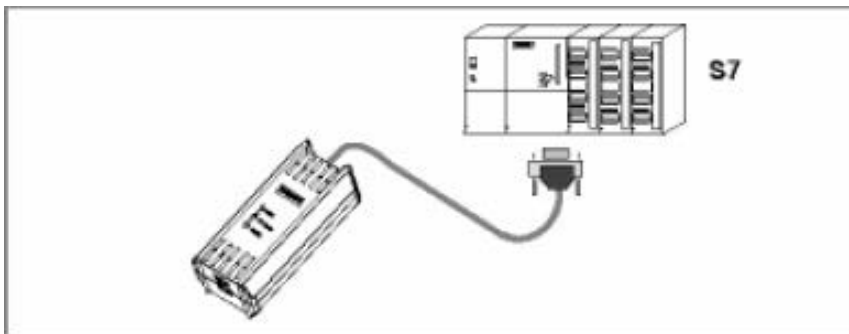
Removing the PC Adapter USB A2

You need to terminate existing communication (e.g. online diagnostics) before you disconnect the PC Adapter USB A2 from your PC.

You must also deactivate the PC Adapter USB A2 in a secure manner before you disconnect it from the PG/PC. To do this, click the "Safely Remove Hardware" icon in the taskbar notification area.

3.3 Use with a stand-alone system

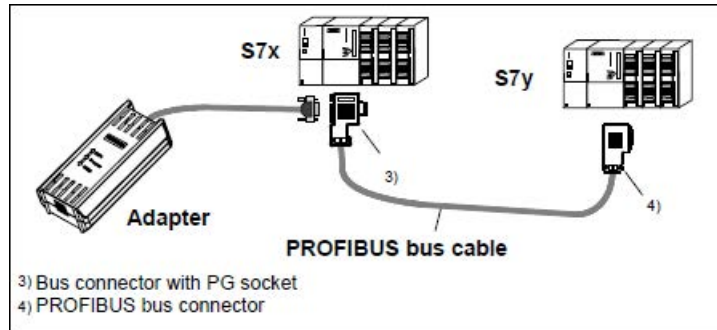
The following figure shows the connection to a single system (1 network node).



After successful installation of the PC Adapter USB A2 and configuration with the configuration console "Communication Settings" or, alternatively, "Set PG/PC Interface", your SIMATIC software package can communicate with the S7 automation system.

3.4 Use in a networked system

The following figure shows you the connection to a networked S7 system (PROFIBUS network with 2 or more network nodes).



After successful installation of the PC Adapter USB A2 and configuration with the configuration console "Communication Settings" or, alternatively, "Set PG/PC Interface", your SIMATIC software package can communicate with the S7 automation system.

Configuration via "Communication Settings" or "Set PG/PC Interface"

To be able to configure the PC Adapter USB A2 via the configuration console "Communication Settings" or "Set PG/PC Interface", follow these steps:

1. Start the configuration console "Communication Settings" or "Set PG/PC Interface".
2. In the navigation on the left, select the interface parameter assignment via which the PC Adapter USB A2 communicates:
 - PC Adapter USB A2 (Auto)
 - PC Adapter USB A2 (MPI)
 - PC Adapter USB A2 (PROFIBUS)
3. In the corresponding "Properties" dialog box, check whether or not the parameter settings match your system configuration and if necessary modify them.

Note

You can find additional information in the online help for the configuration console "Communication Settings" or "Set PG/PC Interface".

Technical specifications

PC Adapter USB A2	
Article number	6GK1571-0BA00-0AA0
Dimensions	approx. 105 x 58 x 26 mm
Weight (including cable)	approx. 365 g
Interfaces	
to the S7/M7/C7	RS 485 (up to max. 12 Mbps)
to the PC	USB 2.0 High Speed
Supply voltage (via USB interface)	5 VDC
Current consumption	200 mA
Safety	
Protection class	Protection class III to IEC 60950
Safety specifications	IEC 60950 corresponds to DIN/EN 60950
Degree of protection	IP20
Electromagnetic compatibility (EMC)	
EMC directive	The PC Adapter USB A2 meets the requirements of the EU directive 2014/30/EU (EMC Directive).
Emission	Residential areas, business and commercial operations, and small businesses: EN 61000-6-3 Industrial area: EN 61000-6-4
Immunity	Residential areas, business and commercial operations, and small businesses: EN 61000-6-1 Industrial area: EN 61000-6-2
Noise immunity on signal lines	PROFIBUS cable: 2 kV (to IEC 61000-4-4, burst) USB cable: 1 kV (to IEC 61000-4-4, burst)
Immunity to discharges of static electricity (ESD)	6 kV contact discharge (to IEC 61000-4-2) 8 kV air discharge (to IEC 61000-4-2)
Immunity to RF interference	10 V/m 80 MHz – 2 GHz, 80% AM (to IEC 61000-4-3) 1 V/m 2 GHz – 2.7 GHz, 80% AM (to IEC 61000-4-3)
RF conductance	10 V/m 10 kHz - 80 MHz (to IEC 61000-4-6)
Climatic conditions	
Temperature	tested to IEC 60068-2-1, IEC 60068-2-2
Operation	+0 °C to +60 °C, temperature change max. 10 K/h
Storage/transportation	-40 °C to +70 °C, temperature change max. 20 K/h
Relative humidity	Tested to DIN IEC 60068-2-78
Operation	5% to 95% at 30 °C
Storage/transportation	tested to IEC 60068-2-30 25 °C and 55 °C at 95%

PC Adapter USB A2

Mechanical environmental conditions

Vibration	tested to DIN IEC 60068-2-6
Operation	5 - 8.4 Hz: Amplitude 3.5 mm, 8.4 - 150 Hz: Acceleration 9.8 m/s ² 10 cycles per axis
Storage/transportation	5 - 8.4 Hz: Amplitude 3.5 mm 8.4 - 500 Hz: Acceleration 9.8 m/s ² 10 cycles per axis
Resistance to shock	tested to DIN IEC 60068-2-27
Operation	150 m/s ² , 11 ms, 6 shocks per axis
Storage/transportation	250 m/s ² , 6 ms, 1000 shocks per axis

Approvals

Note

Validity of the approvals

The specified approvals apply only when the corresponding mark is printed on the PC Adapter USB A2.

Electromagnetic compatibility - EMC directive

The PC Adapter USB A2 meets the requirements of the EU directive 2014/30/EU (EMC Directive).

The PC Adapter USB A2 is designed for use in the following areas:

Area of application	Requirements	
	Emission	Immunity
Residential areas, business and commercial operations, and small businesses	EN 61000-6-3	EN 61000-6-1
Industrial area	EN 61000-6-4	EN 61000-6-2

You will find further information on electromagnetic compatibility in the section "Technical specifications (Page 23)".

RoHs directive

The product meets the requirements of the EU directive 2011/65/EU (RoHS Directive) on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Applied standard: EU L174, 01/07/2011

EU Declaration of Conformity



You will find the EU Declaration of Conformity for this communications processor on the Product Support pages under the following entry ID:

58826997 (<https://support.industry.siemens.com/cs/ww/en/view/58826997>)

UK Declaration of Conformity



The UK declaration of conformity is available to all responsible authorities at:

Siemens Aktiengesellschaft
Digital Industries
DE-76181 Karlsruhe
Bundesrepublik Deutschland

Importer UK:

Siemens plc,
Manchester M20 2UR

You can find the current UK Declaration of Conformity for this product on the Internet pages under Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/15361/cert>).

The SIMATIC NET products described in this document meet the requirements of the following directives:

- UK Regulation
SI 2016/1107 Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016, and related amendments
- EMC Regulation
SI 2016/1091 Electromagnetic Compatibility Regulations 2016, and related amendments
- RoHS Regulation
SI 2012/3032 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012, and related amendments

cULus Approval for Information Technology Equipment



cULus Listed I. T. E.

Underwriters Laboratories Inc. complying with

- UL 60950-1 (Information Technology Equipment)
- CSA C22.2 No. 60950-1-03

Report no. E115352

C-TICK approval



The communications processor meets the requirements of the Australian AS/NZS 3548 standard according to EN 61000-6-3.

FCC approval



This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Marking for the customs union



EAC (Eurasian Conformity)

Eurasian Economic Union of Russia, Belarus, Armenia, Kazakhstan and Kyrgyzstan

Declaration of conformity according to the technical regulations of the customs union (TR ZU)