Product Manual

ABB i-bus® KNX
IP Interface
IPS/S 2.1

Intelligent Installation Systems

LAN

LAN

ABB

IPR/S 2.1

○ ON

○ LAN / LINK

○ Telegram

ABB i-bus®
EIB KNX

ABB

IPS/S 2.1

○ ON

○ LAN / LINK

○ KNX / Telegram

ABB i-bus®
EIB KNX

V DC

V DC

ABB

This manual describes the function of the IP Interface IPS/S 2.1 with
the application program *IP Interface*.
Subject to changes and errors excepted.

Exclusion of liability:
Despite checking that the contents of this document match the hardware and
software, deviations cannot be completely excluded. We therefore cannot accept
any liability for this. Any necessary corrections will be inserted in new versions of
the manual.
Please inform us of any suggested improvements.

ABB i-bus® KNX   **Contents**

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ABB i-bus® KNX   **General**

1   General

The IP Interface IPS/S 2.1 connects the KNX bus with the Ethernet network. KNX telegrams can be sent to or received from other devices via the network. The device uses the KNXnet/IP protocol from the KNX Association for communication.

In older documents and in the ETS 3.0e the KNXnet/IP protocol is also referred to as the EIBnet/IP protocol.

Both protocols and specifications are identical.

1.1   Product and functional overview

The IP Interface can program KNX devices via the LAN using the ETS 3.0e (or higher). It can serve as an interface for a visualisation as well. Its IP address can be fix, assigned via DHCP or AutoIP. For operation an additional 12 to 30 V DC supply is necessary.

ABB i-bus® KNX   **Device technology**

2   Device technology

IPS/S 2.1

2CDC 071 020 F0008

The IP Interface 2.1 is a modular installation device (MDRC) and forms the interface between KNX installations and IP networks. It utilises the local network (LAN) for fast exchange of telegrams.
KNX devices can be programmed via the LAN using ETS 3.0.
The device uses the KNXnet/IP protocol from the KNX Association (Tunnelling).
The IP address can be fixed or can be received from a DHCP server.
The power supply range is from 10 to 30 V DC.

2.1   Technical data

Supply	Supply voltage U_s	10…30 V DC via plug-in terminal
		Ripple: < 5 %
	Power consumption	Maximum 1.9 W at 10 V
	Current consumption	Maximum 190 mA at 10 V
	Leakage loss	Maximum 1.9 W at 10 V
	Rated voltage U_n	12 V DC
	Rated current I_n	145 mA at 12 V
	Current consumption KNX	From KNX < 10 mA
Connections	KNX	Bus connection terminal
	Plug-in terminal for operating voltage	Plug-in terminal
	LAN	RJ45 socket for 10/100BaseT, IEEE 802.3 networks, AutoSensing
Operating and display elements	LED red and button	For assignment of the physical address
	LED green	Operating mode display
	LED yellow	Network connection indicator
		KNX telegram traffic indicator
Enclosure	IP 20	to DIN EN 60529
Safety class	II	to DIN EN 61140
Isolation category	Overvoltage category	III to DIN EN 60664-1
	Pollution degree	2 to DIN EN 60664-1
KNX safety extra low voltage	SELV 24 V DC	
Temperature range	Operation	0 °C…+45 °C
	Storage	-25 °C…+55 °C
	Transport	-25 °C…+70 °C
Ambient conditions	Maximum air humidity	93 %, no condensation allowed

ABB i-bus® KNX   **Device technology**

Design	Modular installation device (MDRC)	Modular installation device, Pro*M*
	Dimensions	90 x 36 x 64 mm (H x W x D)
	Mounting width	2 modules at 18 mm
	Mounting depth	68 mm
Installation	On 35 mm mounting rail	to DIN EN 60 715
Mounting position	as required	
Weight	0.100 kg	
Housing, colour	Plastic housing, grey	
Approvals	KNX to EN 50 090-1, -2	
CE mark	in accordance with the EMC guideline and low voltage guideline	

Application program	Maximum number of communication objects	Maximum number of group addresses	Maximum number of associations
IP Interface	0	0	0

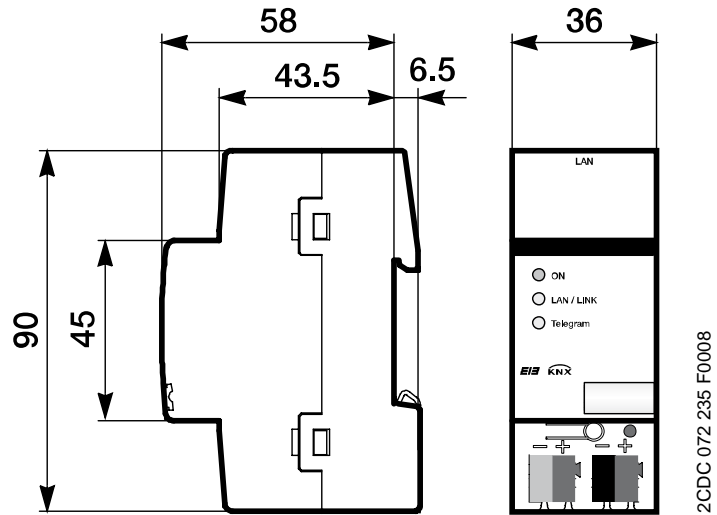| Note |
|---|
| The programming requires EIB Software Tool ETS3 V3.0e or higher. |
| If ETS3 is used a *.VD3 or higher type file must be imported. |
| The application program is available in the ETS3 at ABB/System devices/Interfaces. |
| The device does not support the closing function of a project or the KNX device in the ETS. If you inhibit access to all devices of the project with a *BCU code* (ETS3), it has no effect on this device. Data can still be read and programmed. |

ABB i-bus® KNX   **Device technology**

2.2   Circuit diagram
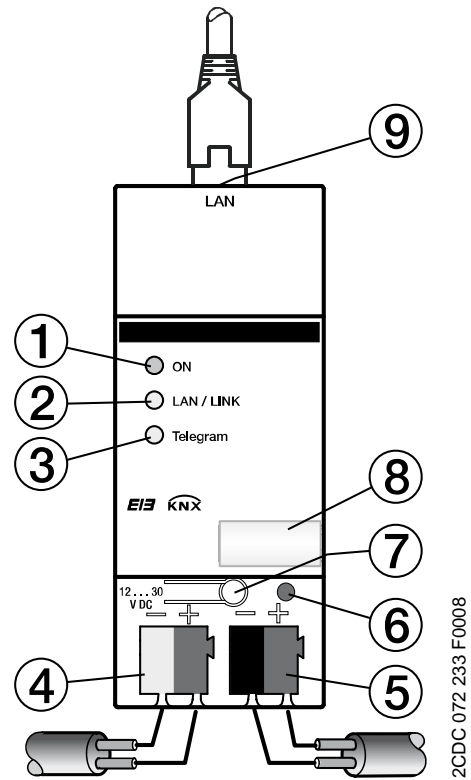
IPS/S 2.1

1 LED ON   6 Programming LED

2 LED LAN/LINK   7 Programming button

3 LED telegram   8 Label carrier

4 Supply voltage connection   9 LAN connection

5 KNX connection

ABB i-bus® KNX   **Device technology**

2.3   Dimension drawing

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ABB i-bus® KNX   **Device technology**

2.4 Assembly and installation

Accessibility to the device for the purpose of operation, testing, visual inspection, maintenance and repair must be provided compliant to DIN VDE 0100-520.

Commissioning requirements

In order to commission the device, a PC with ETS from ETS3 V3.0e or higher as well as an interface to the ABB i-bus®, e.g. via a KNX interface as well as a supply voltage in the range from 10 to 30 V DC is required.

If the IP Interface or other KNX devices are to be programmed via a network (LAN), a PC with LAN connection is required.

The installation and commissioning may only be carried out by electrical specialists. The appropriate norms, guidelines, regulations and specifications should be observed when planning and setting up electrical installations.

- Protect the device from damp, dirt and damage during transport, storage and operation.

- Only operate the device within the specified technical data limits!

- The device should only be operated in an enclosed housing (distribution board)!

Supplied state

The device is assigned with the physical address 15.15.100 in the factory.

The application program is preloaded in the factory. The IP address is set to automatic IP assignment (DHCP/AutoIP).

Assignment of the physical address

The assignment of the address of the ABB i-bus® IP INTERFACE is carried out via the ETS and the programming button on the device.

The device features a programming button for assignment of the physical device address. The red programming LED lights up after the button has been pushed. It switches off as soon as the ETS has assigned the physical address or the programming button is pressed again.

Cleaning

If devices become dirty, they can be cleaned using a dry cloth. Should a dry cloth not remove the dirt, the devices can be cleaned using a slightly damp cloth and soap solution. Corrosive agents or solutions should never be used.

Maintenance

The device is maintenance-free. No repairs should be carried out by unauthorised personnel if damage occurs, e.g. during transport and/or storage. The warranty expires if the device is opened.

ABB i-bus® KNX   **Device technology**

2.5 Description of the inputs and outputs

Supply voltage input 10 to 30 V DC

Only a DC voltage in a range of 10 to 30 V may be connected to the power supply input. We recommend using an NT/S power supply from our range. Once the supply voltage has been connected to the system, a start routine is executed in the device. As soon as it is ready for operation – a maximum of 40 seconds after connecting the supply voltage – the ON LED on front of the device lights up.

Caution
The supply voltage must be between 10 to 30 V DC.
Otherwise the device may be damaged!

KNX connection

The supplied bus connection terminal is used to connect to the KNX bus.

Note
Programming requires ETS3 from version 3.0e or higher.

LAN connection

The network connection is carried out via an Ethernet RJ 45 interface for LAN networks. The network interface can be operated with a transmission speed of 10/100 Mbit/s. Network activity is indicated by the LAN/LINK LED on the front of the device.

2.6 Operating controls

There are no operating controls located on the IP Interface.

ABB i-bus® KNX   **Device technology**

2.7   Display elements

Three indicator LEDs are located on the front of the IPS/S:

🟢   🟡   🟡

ON   LAN/LINK   Telegram

ON

- The LED lights up if the power supply is available and the device is ready for operation.

- The LED flashes when the device starts-up, a maximum 40 seconds after the supply voltage is applied.

LAN/LINK

- The LED lights up if the device detects a connection to the network.

- The LED flashes if the device detects activity on the network, e.g. when data is exchanged.

Telegram

- The LED lights up when a connection to the KNX is available.

- The LED flashes if the device detects a telegram on the KNX.

ABB i-bus® KNX   **Commissioning**

3 Commissioning

3.1 Overview

Parameterisation of the IP Interface is implemented using the Engineering Tool Software ETS3 from version 3.0e.

Note
In general, the preloaded settings can be retained. If changes to the parameterisation are necessary, they must be loaded via the KNX bus (twisted pair). Only the physical address of the IP Interface can be programmed via the LAN.

3.2 Parameters

This chapter describes the parameters of the IP Interface using the parameter window. The parameter window features a dynamic structure so that further parameters or whole parameter windows may be enabled depending on the parameterisation and the function of the outputs.

The default values of the parameters are underlined,
e.g.

Option: yes
             <u>no</u>

ABB i-bus® KNX   **Commissioning**

3.2.1   Parameter window
         IP settings

In the parameter window *IP settings,* settings on the IP side of the IP Interface are undertaken.

Device name [max. 30 char.]

Options: <u>ABB IP-Interface IPS/S</u>

The device name is used for identification of the device on the LAN. After a search query, e.g. by the ETS, every KNXnet/IP device reports its name and can be allocated accordingly. For example, the installation location can be identified by the names assigned to the devices, e.g. IPS/S, HALL, SUB7.

The text may be a maximum of 30 characters in length. This name is also displayed when this device is determined in the ETS as the communications interface.

IP address assignment

Options: <u>automatically (DHCP, AutoIP)</u>
                fixed

- *automatically:* In the standard setting the IP Interface expects the assignment of an IP address by a DHCP server (dynamic host configuration protocol). This server responds to a request by assigning a free IP address to the device. If a DHCP server is not available in the network or it does not respond within 30 seconds, the device starts an auto IP procedure. It assigns itself with an address from the reserved range for auto IP addresses (169.254.xxx.yyy).

- *fixed:* If no DHCP server is installed on the network or if the IP address should remain static, it can be assigned as fixed.
  The parameter window *IP Address* appears.

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3.2.2 Parameter window *IP address*

The parameter window *IP address* is only visible if in the Parameter window *IP settings*, page 14, the option *fixed* has been selected for the *IP address assignment* parameter.

IP address

Options: Byte x   0…255

The IP address is the unique address of the IP Interface in the LAN.
This address should be entered in a byte-by-byte manner, e.g. as follows for address 192.168.0.10:

Byte 1:   192

Byte 2:   168

Byte 3:   0

Byte 4:   10

Subnet mask

Options: Byte x   0…255

The *Subnet mask* defines the network class. The subnet mask must be set to reflect the number and structure of the subnet. In the simplest case of a small network the subnet mask 255.255.255.0 should be set as follows:

Byte 1:   255

Byte 2:   255

Byte 3:   255

Byte 4:   0

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Default gateway

Options: Byte x   0…255

The parameter *Default gateway* defines the connection point, e.g. the IP address of a router between networks through which IP telegrams are transferred. These gateways are only available in larger networks. For smaller networks the setting 0.0.0.0 can be retained.

ABB i-bus® KNX   **Commissioning**

3.3   Communication objects

The IP Interface IPS/S has no KNX communication objects.

3.4   IPS/S as a programming interface

The IP Interface IPS/S can be used together with the ETS as a programming interface.

The following settings can be used:

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3.4.1   Settings from ETS3.0f

The ETS connects for programming purposes to the interface's physical address in order to program devices in the line.

For this purpose the ETS must be set as follows via the window *Extras/Options/Communication*:
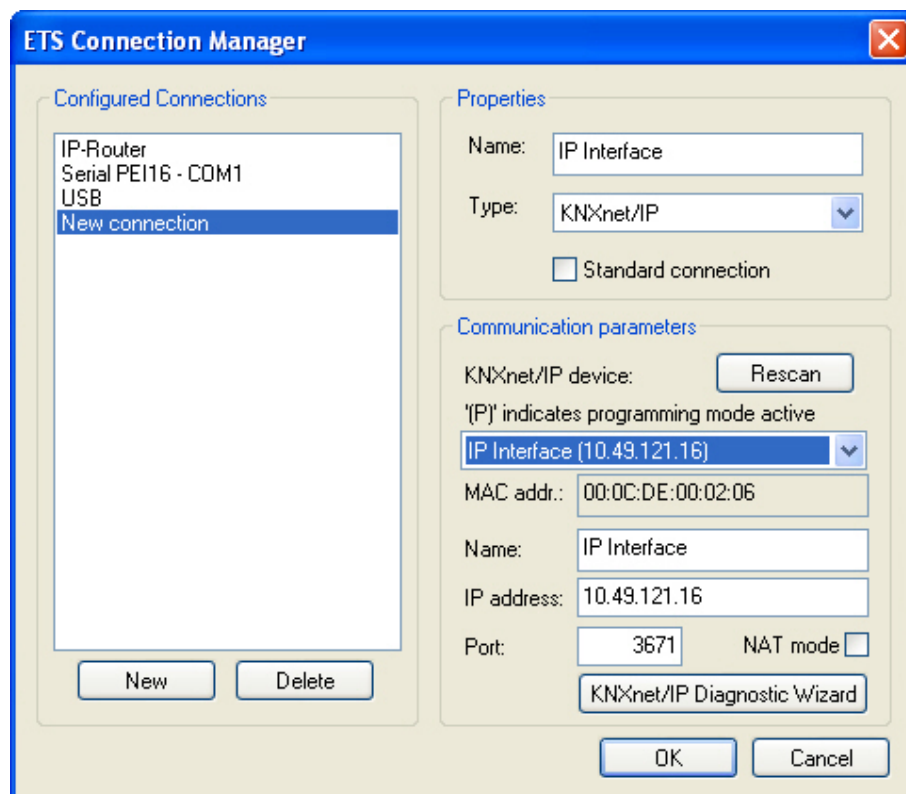
- Click *Configure interface*, a new window appears.

- Click on *New*.

- The name should be overwritten, e.g. *IP Interface*.

- Select the *KNXnet/IP* type.

- The ETS now searches automatically via the LAN connection for KNXnet/IP devices in the network and indicates them in the combination field under KNXnet/IP device.

- Select the device from the combination field. If it is not shown click on *Rescan*.

- After selection of the device, its data, e.g. MAC or plain text name, are displayed:

- With the acknowledgement OK, the setup of the IPS/S as a programming interface is completed.

If the required device is not connected, the connection can be checked by clicking on the button *KNXnet/IP Diagnostic Assistant*.

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After completion of the settings, the connection to the IPS/S can be tested by clicking on *Test* in the new window:
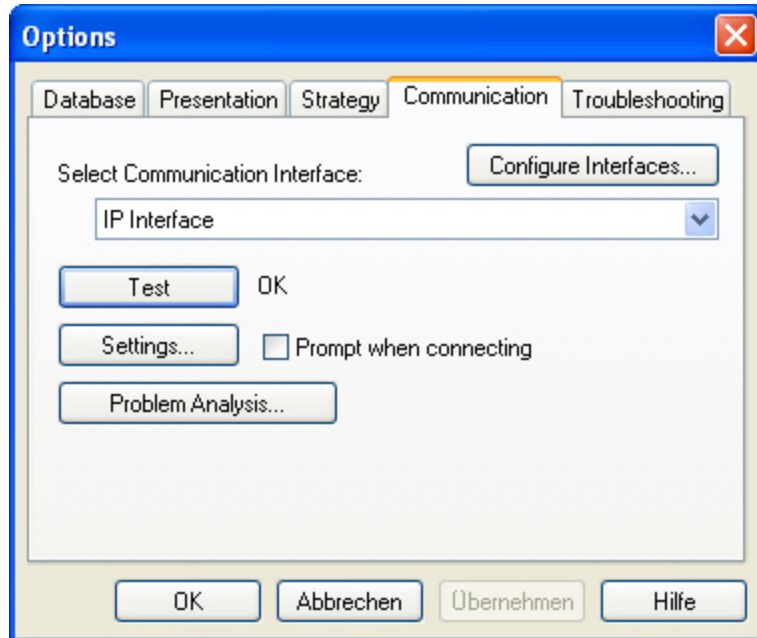
The physical address of the interface can be set via the Settings button. The following window appears:

It must be assured that the physical address of the tunnelling connection matches the topology. E.g. if the interface is added to line 1.1, a topologically correct address would be 1.1.255.

ABB i-bus® KNX   **Planning and application**

4 Planning and application

4.1 The IP Interface in the network

The IP Interface is designed for use in 10/100 BaseT networks compliant to IEEE802.3. The device features an AutoSensing function and sets the baud rate (10 or 100 MBit) automatically.

4.1.1 IP Address of the IPS/S

The IP address of the device can be received from a DHCP server. For this purpose the automatic assignment setting of the IP address in the ETS is required, see Parameter window IP settings, page 14. If no DHCP server is found with this setting, the device starts an AutoIP procedure and autonomously assigns an IP address from the range 169.254.xxx.yyy.

The IP address which the device receives during start-up (via DHCP or AutoIP) is retained until the next restart (switch on/off or reprogramming).

If the IP address of the IPS/S is to have a fixed assignment, in the ETS a fixed IP address (as well as a subnet mask and standard gateway) are set, see Parameter window *IP settings*, page 14.

Note
If the IP Interface is subjected to IP-, TCP- or UDP flooding (attack from the Internet) the device may not be reachable during that attack. All services are reachable again after the flooding has stopped. To avoid this behaviour a rate limiter at network level has to be used. Please discuss the topic with your network administrator.

ABB i-bus® KNX   **Appendix**

A   Appendix

A.1   Ordering information

Short description	Designation	Order No.	bbn 40 16779 EAN	Price group	Weight 1 pc. [kg]	Packaging [pc.]
IPS/S 2.1	IP Interface, MDRC	2CDG 110 098 R0011	**664 84 4**	P2	0.1	1

ABB i-bus® KNX **Appendix**

A.2   Notes
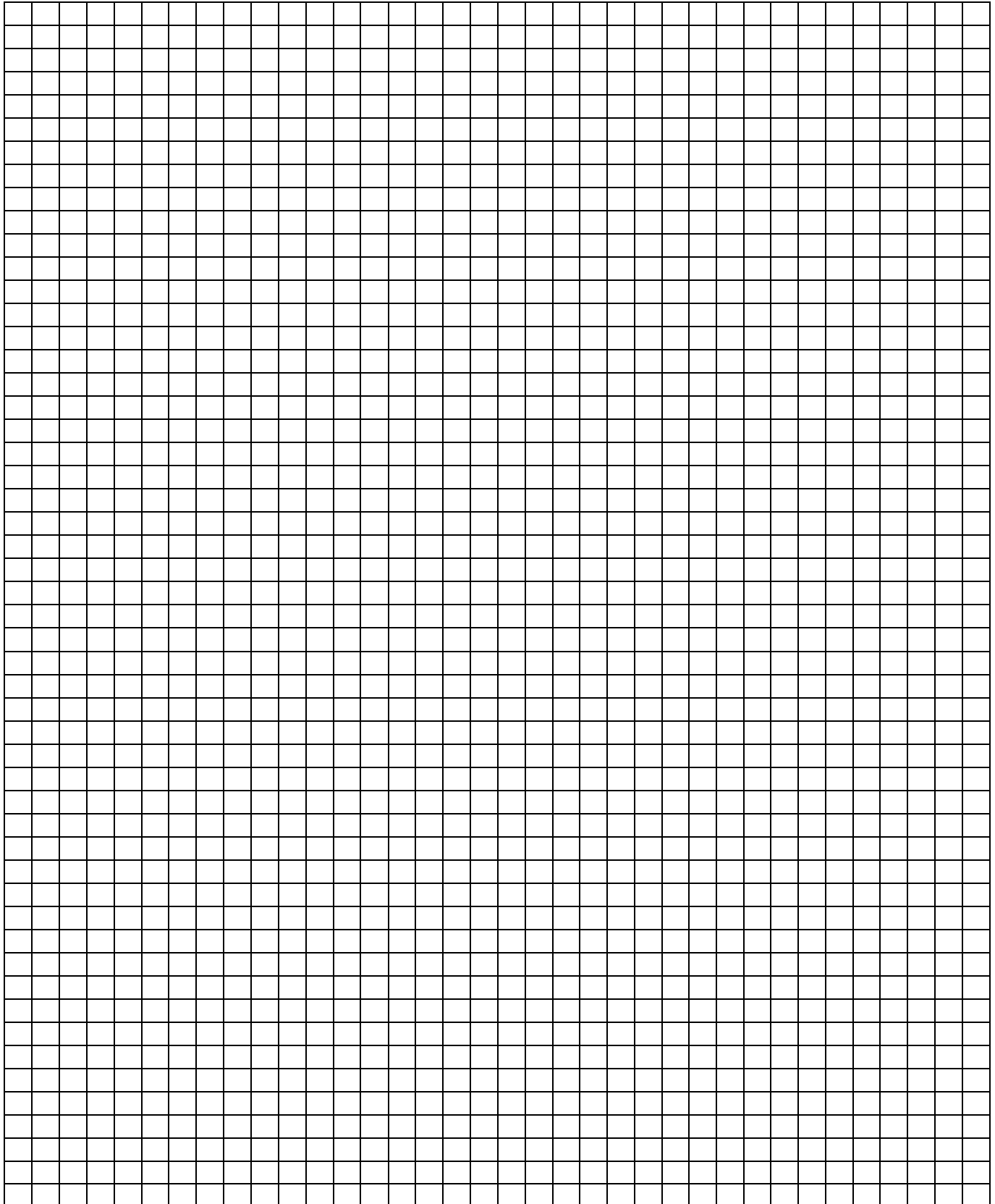
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