

BQ360
MODBUS DIGITAL INPUT DEVICE
USER MANUAL

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About Device

BQ360 is an 24 channel Modbus Digital Input device. Device supports Modbus RTU over RS485. Holding register, Input Register and Coils commands of Modbus RTU is supported.

Device Modbus address can be set by user. Also baudrate of device is adjustable. But 8 Bit , No Parity and 1 Stop bit si fixed. Device addresses between 1 and 14 can be set from switches on device. Also you can set address greater than 14; but you must use device manager program for this.

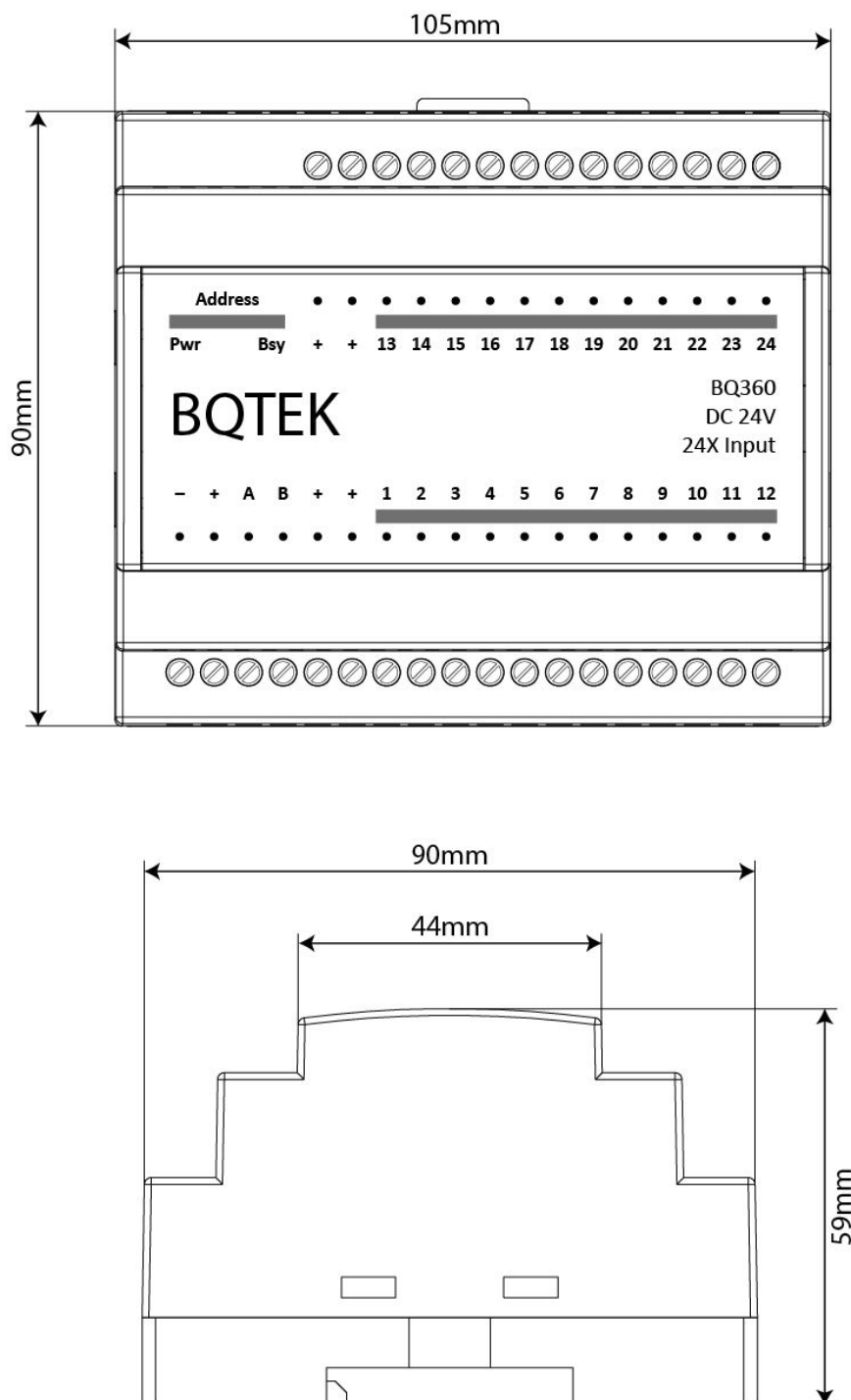
Device Properties

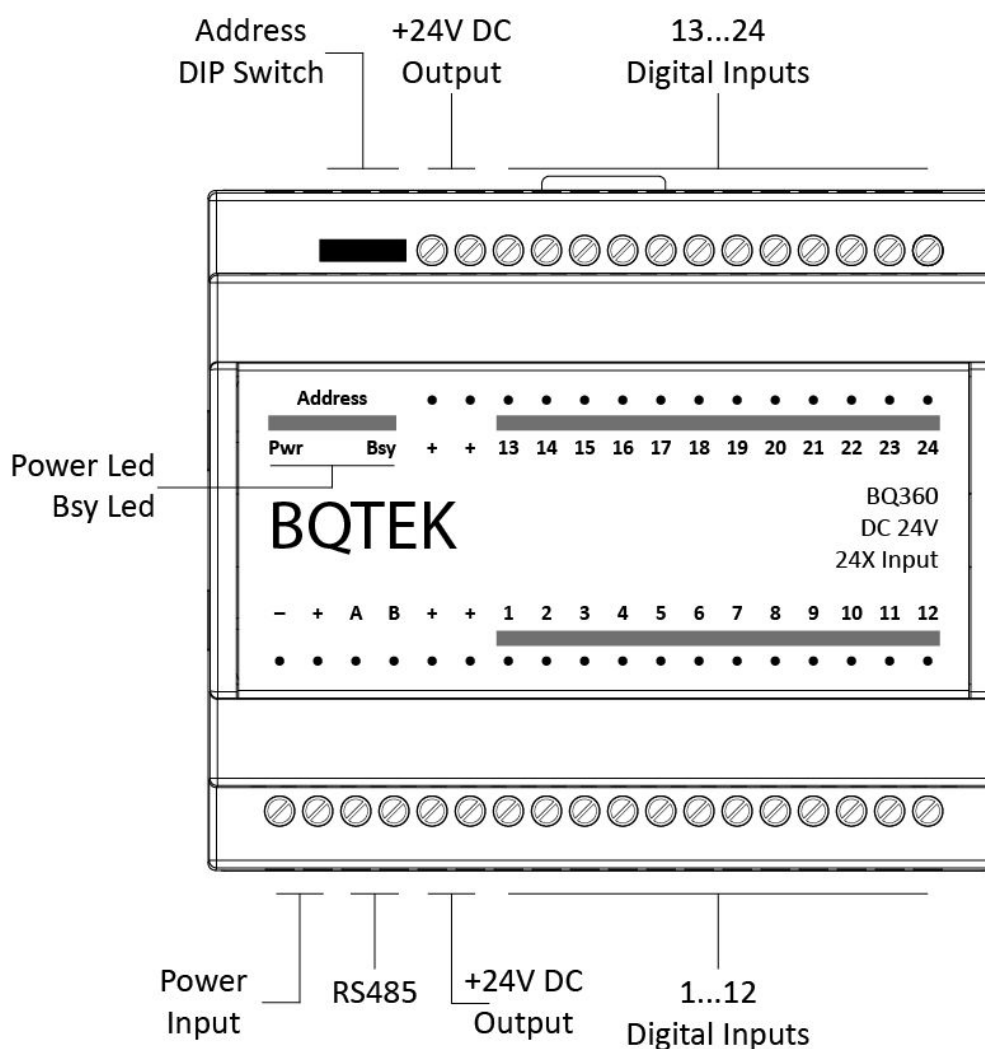
Product Code	BQ360
Product Name	Modbus Digital Input Device 24 Channel
Input	Triggered by +24V DC Optic isolated inputs
Power Need	24V DC
Enclosure	Rail Type 110 x 90 x 60 mm (Also suitable for wall mounth)
Terminal	Screw type terminal (5.08mm)
Protocol	Modbus RTU over RS485

Factory defaults for communication is 9600 Baud, 8 Bit, No Parity, 1 Stop Bit and Modbus address is 1. You can change modbus address with DIP switch or with Modbus Device Manager Software. Also this default 9600 baud can be adjustable.

Device Layout

You can see device layout at the picture below. Terminals are screw type terminals. You can also find descriptions about device connections on the device enclosure.





Power Supply

Device works with 24V DC power. Max current is about 100mA. Connect + and - terminals to power supply.

RS485

A and B terminals are for RS485 communication. Please obey RS485 cabling rules and use suitable cable for RS485

Dip Switch

Dip switches are for device settings mode and for adjusting and address. Please read this document for usage of dip switch.

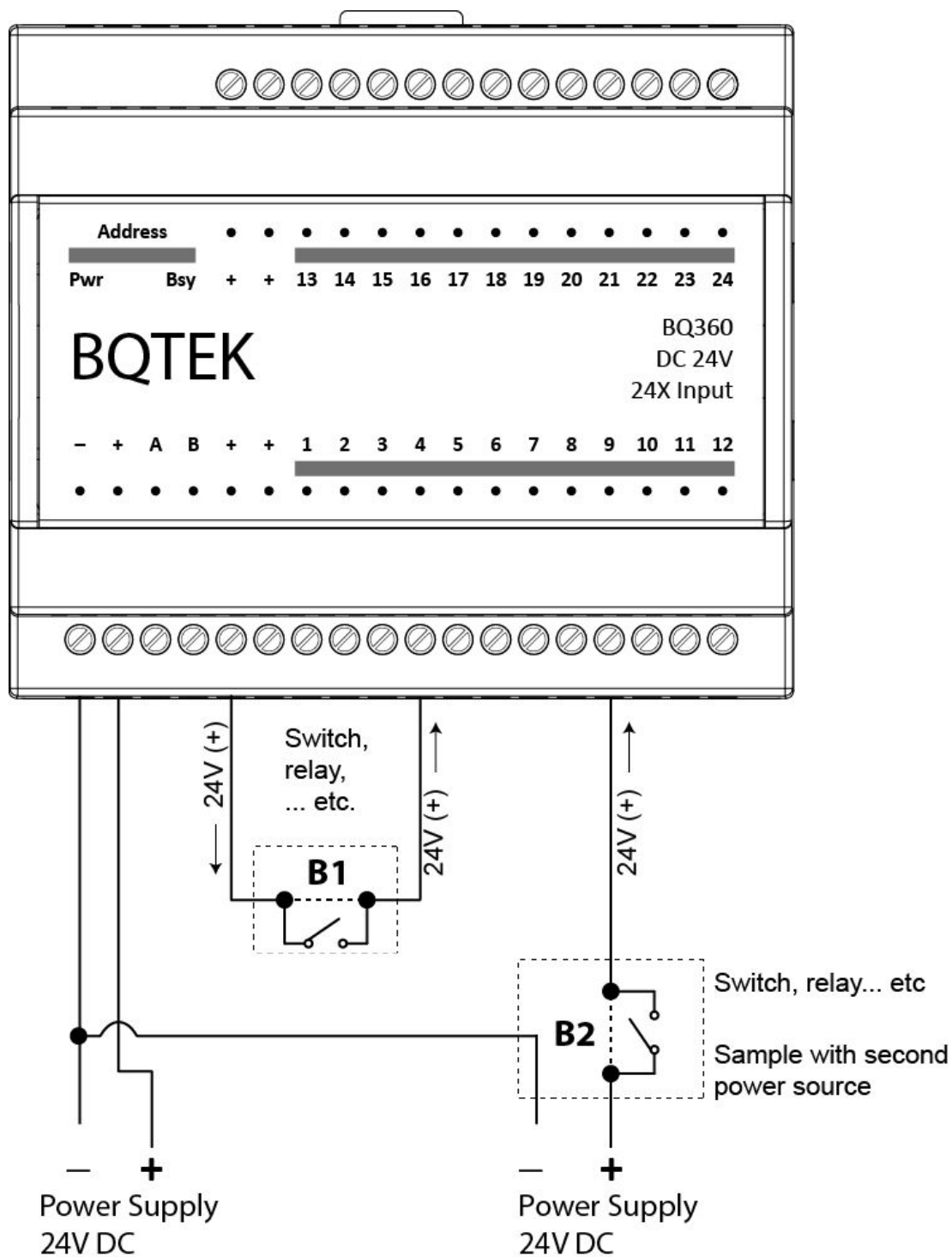
Digital Inputs

Device has 24 digital input. Inputs can be triggered with +24V DC.

Leds

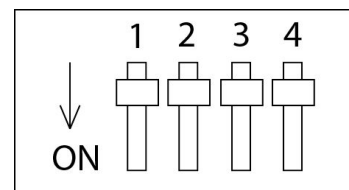
Power led shows device is working. Busy led means there is an communication over RS485. Each relay led means status of relay. Also in device settings mode Power led and busy light is on together during power on. Detailed information about settings are explained next pages in document.

Sample connection is shown at the picture:



DIP Switch and Address Settings

You can change device modbus address between 1-14 with DIP switch on device. Address greater than 14 can be set from Modbus Device manager software. Making changes and applying changes also needs DIP switch settings.



DIP Switch Modes

Description	1	2	3	4
Settings Mode (Changing device settings from RS485)	OFF	OFF	OFF	OFF
Address 1	ON	OFF	OFF	OFF
Address 2	OFF	ON	OFF	OFF
Address 3	ON	ON	OFF	OFF
Address 4	OFF	OFF	ON	OFF
Address 5	ON	OFF	ON	OFF
Address 6	OFF	ON	ON	OFF
Address 7	ON	ON	ON	OFF
Address 8	OFF	OFF	OFF	ON
Address 9	ON	OFF	OFF	ON
Address 10	OFF	ON	OFF	ON
Address 11	ON	ON	OFF	ON
Address 12	OFF	OFF	ON	ON
Address 13	ON	OFF	ON	ON
Address 14	OFF	ON	ON	ON
Get Address from Settings (Apply Settings that made from RS485)	ON	ON	ON	ON

Device default baudrate is 9600 baud. (8bit, No Parity, 1 Stop) Adjust any address between 1..14 and easily start to use. For other baudrates and addresses read the document.

Supported Modbus Commands

Device supports listed commands below. These are standard Modbus RTU commands. Most PLC, HMI and Scada applications supports this commands.

Command Description	Command (HEX)
Read Holding Register	03
Read Input Register	04
Read Coils	01
Read Discrete Inputs	02

If input is +24V you can read it as 1; but else you will read as 0

Register - Coil Table

Global Modbus specifications says first address is 1 but sometimes some PLC or scada applications accept 0 as first modbus register address. Our documents are prepared for based 1. If your plc accept 0 based register addresses; you can decrease -1 from the addresses below.

Input ID	Register Number	Coil Number
Input 1	1	1
Input 2	2	2
Input 3	3	3
Input 4	4	4
Input 5	5	5
Input 6	6	6
Input 7	7	7
Input 8	8	8
Input 9	9	9
Input 10	10	10
Input 11	11	11
Input 12	12	12

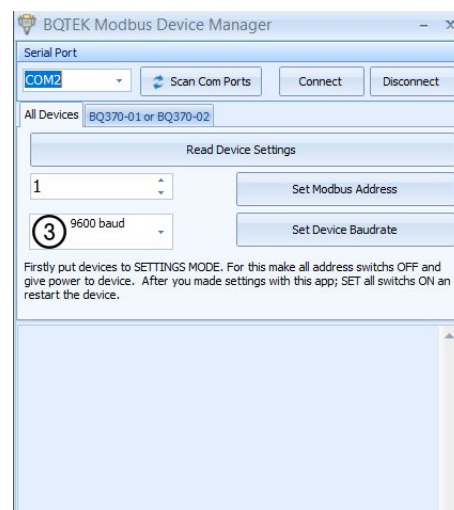
Input ID	Register Number	Coil Number
Input 13	13	13
Input 14	14	14
Input 15	15	15
Input 16	16	16
Input 17	17	17
Input 18	18	18
Input 19	19	19
Input 20	20	20
Input 21	21	21
Input 22	22	22
Input 23	23	23
Input 24	24	24

Device Settings with “Modbus Device Manager”

Device default baudrate is 9600 baud. (8 Bit, No parity, 1 Stop)
You can adjust device address from DIP switch and you can start using device with 9600 baud easily.

But sometimes you can need other baudrates or you can need addresses greater than 14. In this situation you can change device settings with RS485.

For this you must put device to “Settings Mode”. After than you can change device settings with our “Modbus Device Manager” application. Also experts users can use Modbus RTU protocol for changing settings instead of Modbus Device Manager. Expert users can reach detailed information about our web page or can contact with us.



Settings Mode

For making settings from “Modbus Device Manager”; you must put device settings mode. Power off device and put all DIP switches to “OFF” position. Now you can give power to device. You will see power and busy led is ON together; this shows device is in “Settings Mode”

Now connect RS485 to computer and use “Modbus Device Manager” application for reading or changing device settings.

After making changes you must exit from “Settings Mode” For this set all DIP switches ON position and reset the power of device.

Supported baudrates are 2400, 4800, 9600, 14400, 19200, 28800 and 38400 baud.

If you don't have RS485 port on your computer you can use USB-RS485 converter devices for this.

Also as explained before experts users can change settings from RS485 with Modbus RTU commands.

You can find information about this in our web page.