INFRARED COMMAND BANK

DV-IR16D
Manual

CONTENT

1. General description.

Bank of infrared commands DV-IR16D (here in after referred to as IR bank) is an electronic controller designed to store commands from remote control panels of infrared range household appliances and issue them through any multiplexed channel using DV-IRTR3 IR transmitters. Up to two DV-IRTR3 IR transmitters can be connected to each controller output channel. Any command stored in the DV-IR16D's memory can be sent to any transmitter connected to it.

Structurally, the IR bank is made in a housing for standard mounting on a DIN rail. The board and appearance of the IR bank are shown in Picture 1.

Picture 1 Board and appearance DV-IR16D

2. Specifications.

Table 1. Specifications

Number of IR output channels	8
Memory	2Mbps/2000 commands
Load capacity of the modulator channel at Upit 12V	20-500kHz
Range of radiated commands	
Serial port parameters when working in the system:	
Speed, baud	19200
Number of bits	7
Parity	even
Stop bit	1
Control Interface	RS485 half duplex
Control protocol	ModBus ASCII
Serial port parameters when filling the IR command bank:	
Speed, baud	19200
Number of bits	8
Parity	Odd

Stop bit	1
Control Interface	RS485
IR control protocol	original
Supply voltage	10-16 V
Current consumption, in the IR bank data download mode, not more than	0.3 A
Current consumption, in the IR command synthesis mode	0.8 A
Power indication	red LED
Command recording mode indication	yellow light
Channel operation indication	16 blue LEDs
Overall dimensions (WxHxD), mm	70x86x57
Size	4DIN
Device weight	64 g

3.   Composition of the product.

Delivery includes:
1) infrared command bank DV-IR16D - 1 pc.;
2) operation manual DV-IR16D - 1 pc.;

4. Description of the operation of the IR bank.
4.1. Work algorithm.

When the power is turned on, the IR-bank performs its own settings (address, command reception rate, output status, operation mode), after which it is ready to receive control commands from the head unit.

In the mode of loading IR commands into the memory of the IR bank, indication occurs, during the loading process, in the form of a blinking yellow LED (see Picture 3) on the device board.

To switch to the operating mode, it is enough to turn off the power of the IR-bank, when the device is turned on again, the operating mode will be set.

Upon receipt of a command, the IR-bank processes it, responds by issuing a modulated IR signal through the appropriate channel, and returns information about the execution of the command to the central controller.PWhen receiving a command to write an address (working with the DIVISION Controllers program), it sends a response to the controller with the current value of its own address.

Before using the IR-bank as part of the DIVISION Smart Home complex, you should write down its address in the system into its internal memory and download the set of necessary IR commands. A new, unprogrammed module is supplied by the manufacturer with preset address 01.***Programming and testing of the module is carried out using the DIVISION Controllers service program.***

4.2. Appearance and installation of the IR bank.
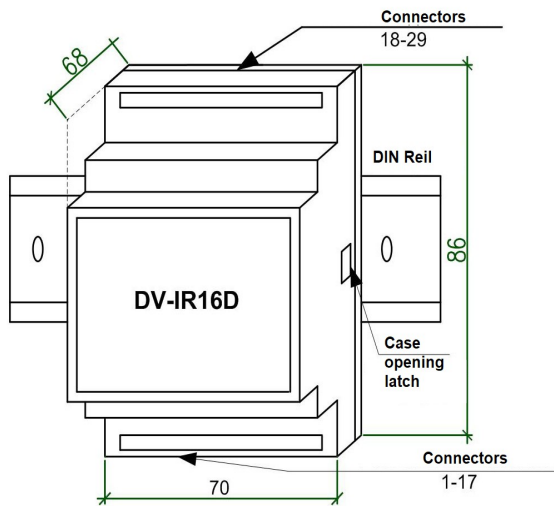
Picture 2 Appearance of the IR bank

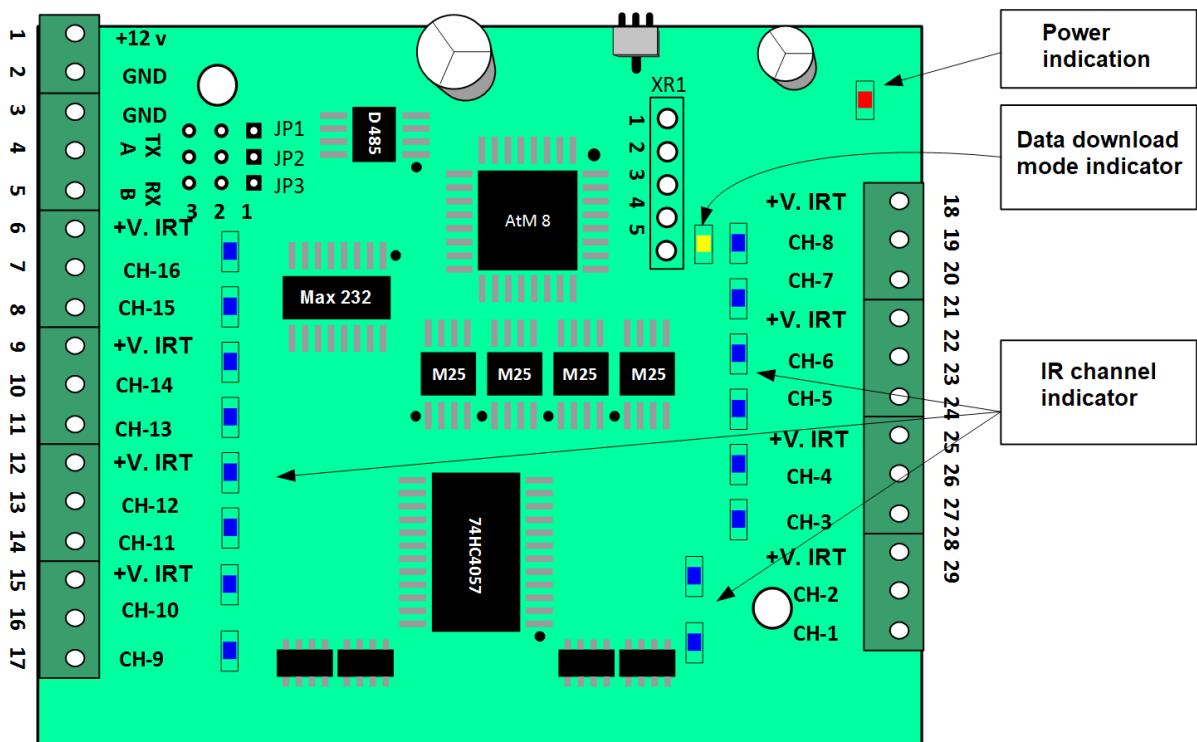### 4.3. Assigning contacts.

A schematic view of the IR bank board is shown in Picture 3.
For visual control of the operation of the IR bank, there are LEDs on the board:
· red LED - indication of the power supply of the IR bank;
· yellow LED - indication of the recording mode of infrared commands;
· 16 blue LEDs - indication of channel operation.

Picture 3 Pin Assignment of IR Bank DV-IR16D

Designations on the IC bank board:

CH-1 ... CH-8 output channels	IR transmitter №1-8
+V.IRT	power outputs for IR transmitters
GND	common
TX(A), RX(B) RS485	interface input lines

The purpose of the terminal contacts is given in table 1.

Table 2. Assignment of terminal contacts.

Contact numbers	Pin assignment
1	Module power input +(10 - 16) V.
2	Common power wire
3	common wire
4	Input channel A RS-485
5	Input channel B RS-485
7	IR transmitter amplifier output #16
8	IR transmitter amplifier output #15
10	IR transmitter amplifier output #14
11	IR transmitter amplifier output #13
13	IR transmitter amplifier output #12
14	IR transmitter amplifier output #11
16	IR transmitter amplifier output #10
17	IR transmitter amplifier output #9
19	IR transmitter amplifier output #8
20	IR transmitter amplifier output #7
22	IR transmitter amplifier output #6
23	IR transmitter amplifier output #5
25	IR transmitter amplifier output #4
26	IR transmitter amplifier output #3
28	IR transmitter amplifier output #2
29	IR transmitter amplifier output #1
6, 9, 12, 15, 18, 21, 24, 27	Outputs + power supply of IR transmitters

4.4. Operating modes.

The DV-IR16D infrared command bank has three modes of operation:
–   recording IR commands,
–   testing and addressing,
  –   as part of the Smart Home DIVISION system.

The IR bank is shipped from the factory with an empty command memory. For the operation of the IR-bank, it is necessary to write into its memory all the infrared commands that are supposed to be used in controlling the devices of the DIVISION Smart Home system.

The testing and addressing mode is used when checking the operability of the IR bank, as well as writing the address into it. Setting the address is necessary for further identification of the device in the DIVISION Smart Home system.

The IR-bank is designed for regular operation as part of the DIVISION Smart Home system under the control of a central controller. Instructions for setting up and connecting the IR bank for each mode of operation are given in section 5 of this manual.

5. Operation of the module.
5.1. Testing and addressing mode.

This mode is used to check the operability of the IR bank and assign an address to it.

The following equipment is required for operation:
- DC source 12V, 1A;
- USB/RS485 interface converter;
- personal computer with Windows 7 and above;
- DIVISION Controllers testing and addressing program;
- connecting wires.

In the testing and addressing mode, the IR-bank module is connected to a personal computer and a power source according to the scheme shown in Picture 4.
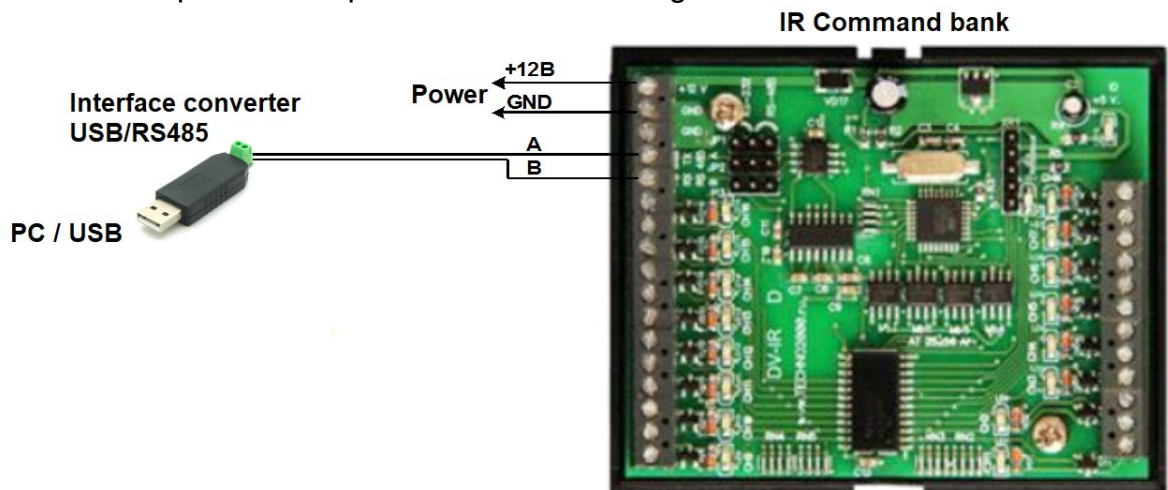
Picture 4 Connecting the DV-IR16D IR bank to a personal computer in the testing and addressing mode

The DIVISION Controllers program is installed on a personal computer, which can be downloaded from the DVC Technologies website:division.business→ Shop → *Hardware and software → Software → DIVISION controllers. In the same section of the site is a description of the program. Please read this manual before using DIVISION Controllers.*

5.2. The procedure for performing efficiency.

Connect moduleIR bankusing an interface converter (USB-RS485) toUSB inputpersonal computer and to a 12V power supply, observing the polarity, according to the diagram shown in Picture 4.

Turn on the power supply, while the red LED on the module board will light up - power indication.The absence of the power indicator on the module board indicates a device malfunction.

Install on a personal computer and run the DIVISION Controllers program. In the program, in the "COM port" window, select the desired port or "Auto Search" andPress the "Search device" button.

When delivered by the manufacturer, the address 01 is set on the device. To write a new address, you need to click the "Address to be set" button in the drop-down menu, select the address to be set, for example 04, click "write address". Search for the device again, make sure that the device responds to the newly set address.

5.3. IR command recording mode.

For the IR-bank to work, it is necessary to write into its memory all the infrared commands that it will have to send to peripheral devices. The new IR bank comes with an empty infrared command memory.IR commands are written to the device memory in batches. The maximum packet size for the DV-IR16D IR bank is 2 Mbit, this memory capacity is enough to store approximately 2000 IR commands.

IR commands are recorded in the DIVISION Constructor program when creating a control script. The description of the process of creating a script and the algorithm for writing IR commands to the IR bank is described in the "DIVISION Constructor Software Operation Manual".To conduct a test check of writing commands to the IR bank without creating a control script, it is enough to use the DIVISION Controllers program.

To check an entry in IK-bank, you needthe following equipment:
– DC source 12V, 1A;
– USB/RS485 interface converter;
– personal computer with Windows 7 and above;
– DIVISION Controllers testing and addressing program;
– connecting wires.

The procedure for recording infrared commands in the IR bank:
Connect the IR bank to the COM port of the personal computer according to the scheme shown in Picture 4.

Install on a personal computer and run the DIVISION Controllers program. In the program, in the "COM port" window, select the desired port or "Auto Search" andPress the "Search device" button. Using the DIVISION Controllers program field - "Select a command" select from the list - "write 3 commands to IC Bank"and click the "Execute" button. At the end of the recording, IR-bank replies that the package is loaded from the file toIR bankwas successful and in the DIVISION Controllers program, in the service information output window, messages will appear about the process of recording each of the three commands and the total number of

commands recorded in the IR bank. INThe id of the program interface window is shown in Picture 5
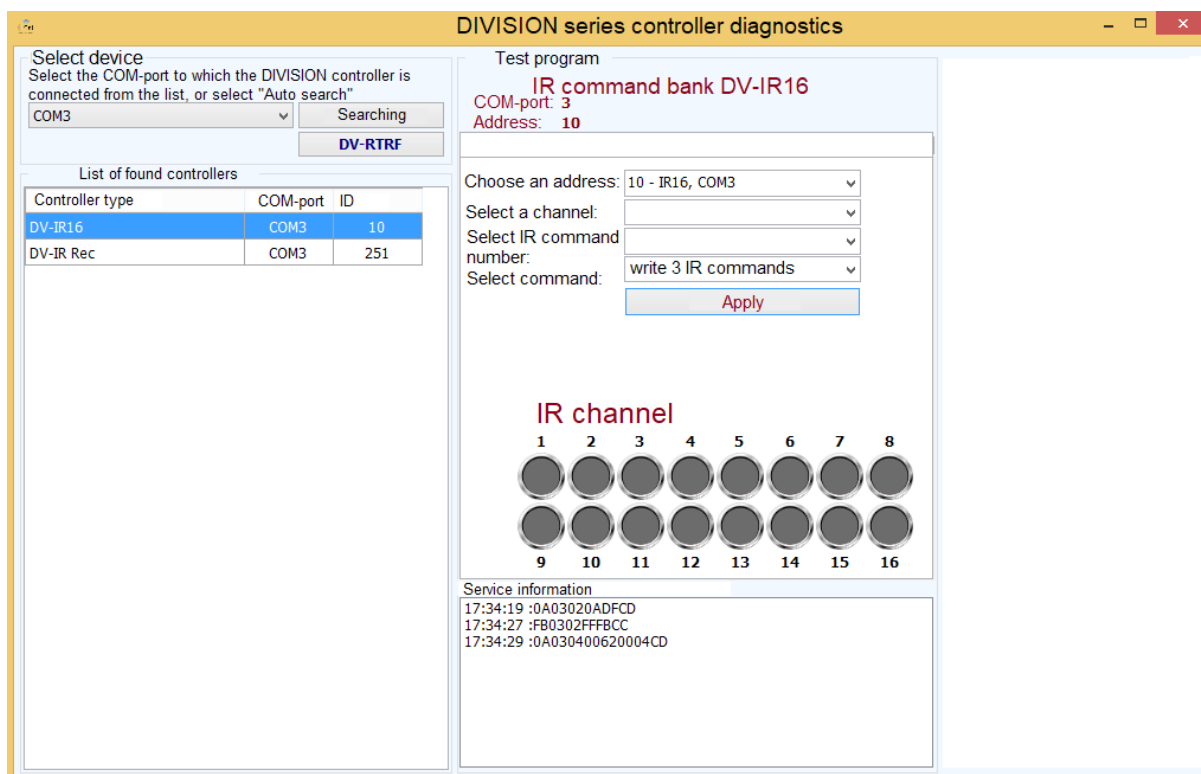
Picture 5 View of the interface window of the DIVISION Controllers program.

To remove IRcommandsfrom module memoryyou must use the DIVISION Constructor program.The description of the process of erasing IR commands from the IR bank is described in the "DIVISION Constructor Software Operation Manual".

5.4. Work as part of the DIVISION system.

The IR-bank is designed to work as part of the DIVISION Smart Home system. In the IR-bank system, it performs the functions of storing infrared commands, as well asissuing them through any multiplexed channel using DV-IRTR3 IR transmitters. Up to two DV-IRTR3 IR transmitters can be connected to each controller output channel. Any command stored in the memory of the IR bank can be sent to any of the transmitters connected to it.

When using the IR-bank as part of the Smart Home complex, first you need to write down the personal address of the IR-bank in the system in the testing and addressing mode (according to clause 5.2. of this manual), then write all the necessary commands into the device's memory in the mode of recording infrared commands (according to clause 5.3 of this manual). The address of each system device is selected when programming the Smart Home complex in the DIVISION Constructor editor.

After writing all the IR packets and the personal address, the IR bank module is connected to the central controller according to the scheme shown in Picture 6.
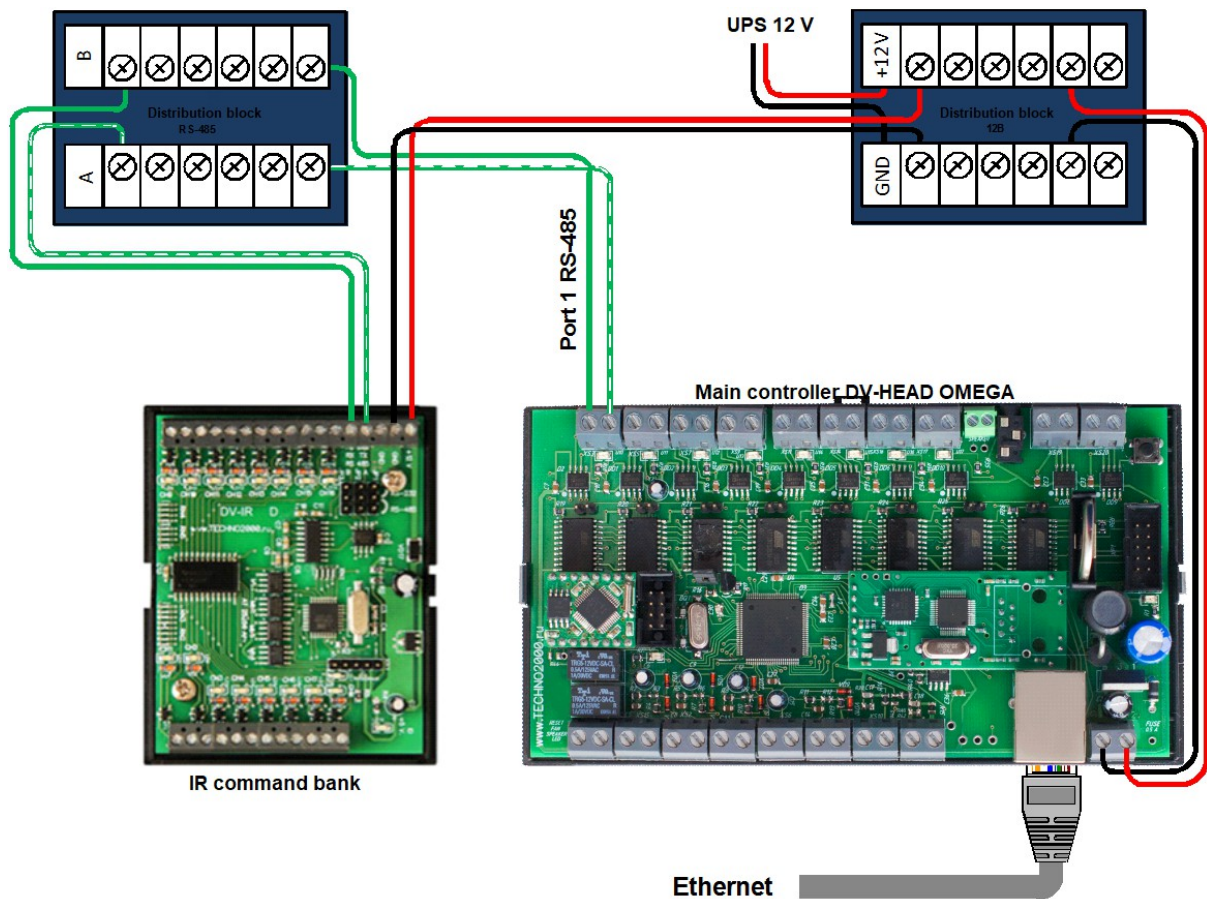
Picture 6 Standard connection of the DV-IR16D infrared command bank in the Division system to the RS485 of the DV-HEAD OMEGA central controller

1. IR bank module connects directly to DV-HEAD OMEGAvia RS485 interface.

2. The DIVISION configuration installed on the central controller automatically recognizes the module by the recorded personal address.

3. IR transmitters are connectedto the terminal blocks of the IR-bank module using screw connectors. The purpose of the connector terminals is given in section 4.3. this guide.

IR transmitters are located one in each room of the house, to transmit commands from the memory of the IRjar. The channel numbers to which the IR transmitters are connected are the same as the output numbers and are assigned by the installer when creating the system configuration in the DIVISION Constructor program.

5.5. Maintenance

Technical maintenance of the IK-bank is carried out according to the preventive-planning system. Maintenance work includes:
- checking the external state of the device;
- performance check in accordance with clause 5.2. this manual;

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– checking the reliability of the module fastening, the condition of external mounting wires and contact connections.

6. Storage.

Module storage temperature range from -40^{0}C to +50^{0}C.

When storing the module in rooms with a negative temperature range, it is necessary to keep the device at room temperature (+20^{0}C).

In the premises for storing the IR-bank there should be no vapors of acids, alkalis, aggressive gases and other harmful impurities that cause corrosion.

7.Manufacturer's warranty.

The manufacturer guarantees the operability of the device provided that the consumer observes the rules of transportation, storage, installation and operation.

The warranty period of operation is 36 months from the date of commissioning, but not more than 40 months from the date of shipment.

When sending the product for repair, an act with a description of a possible malfunction must be attached to it.

8. Information about the manufacturer.

DVC Technologies Website: https://division.business

9. Certificate of acceptance and packaging.

IR Command Bank DV-IR8Dmanufactured and accepted in accordance with the current technical documentation, recognized as suitable forI have been operated and packaged by DVC Technologies.

Responsible for receiving and packaging

OTK

MP _____ _____

FULL NAME. year, day, month