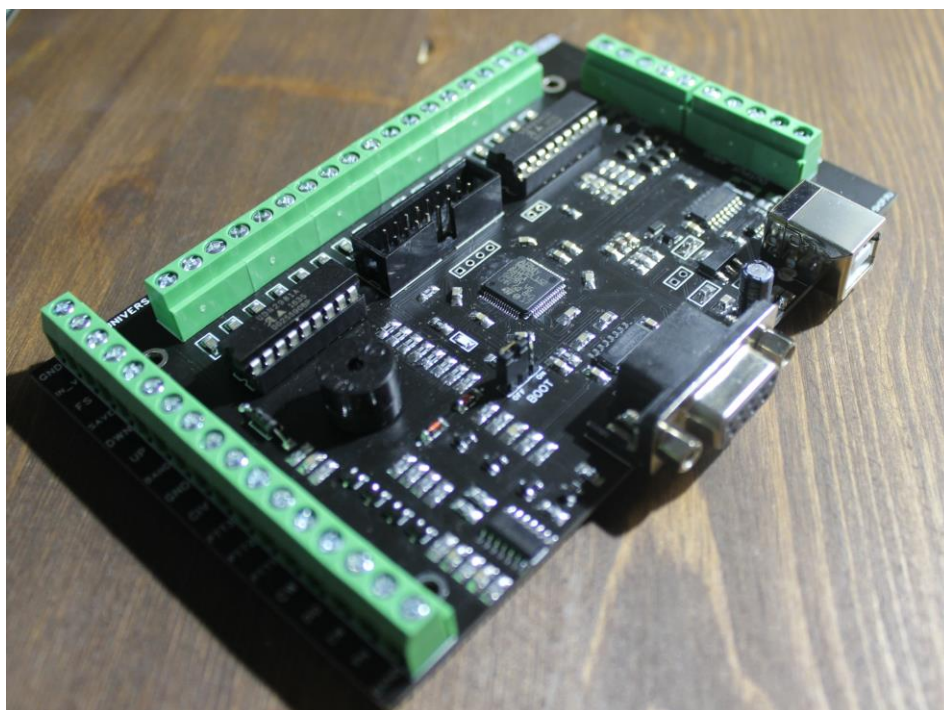


Universal automatic band decoder (USB interface, CW, PTT)

Manual



Irkutsk, Siberia
2022

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1. General description of the device and its functionality
2. Description of input and output signals of the device
3. Connections between PC and TRX
4. External connections
5. Scheme and dimensions



1. General description of the device and its functionality.

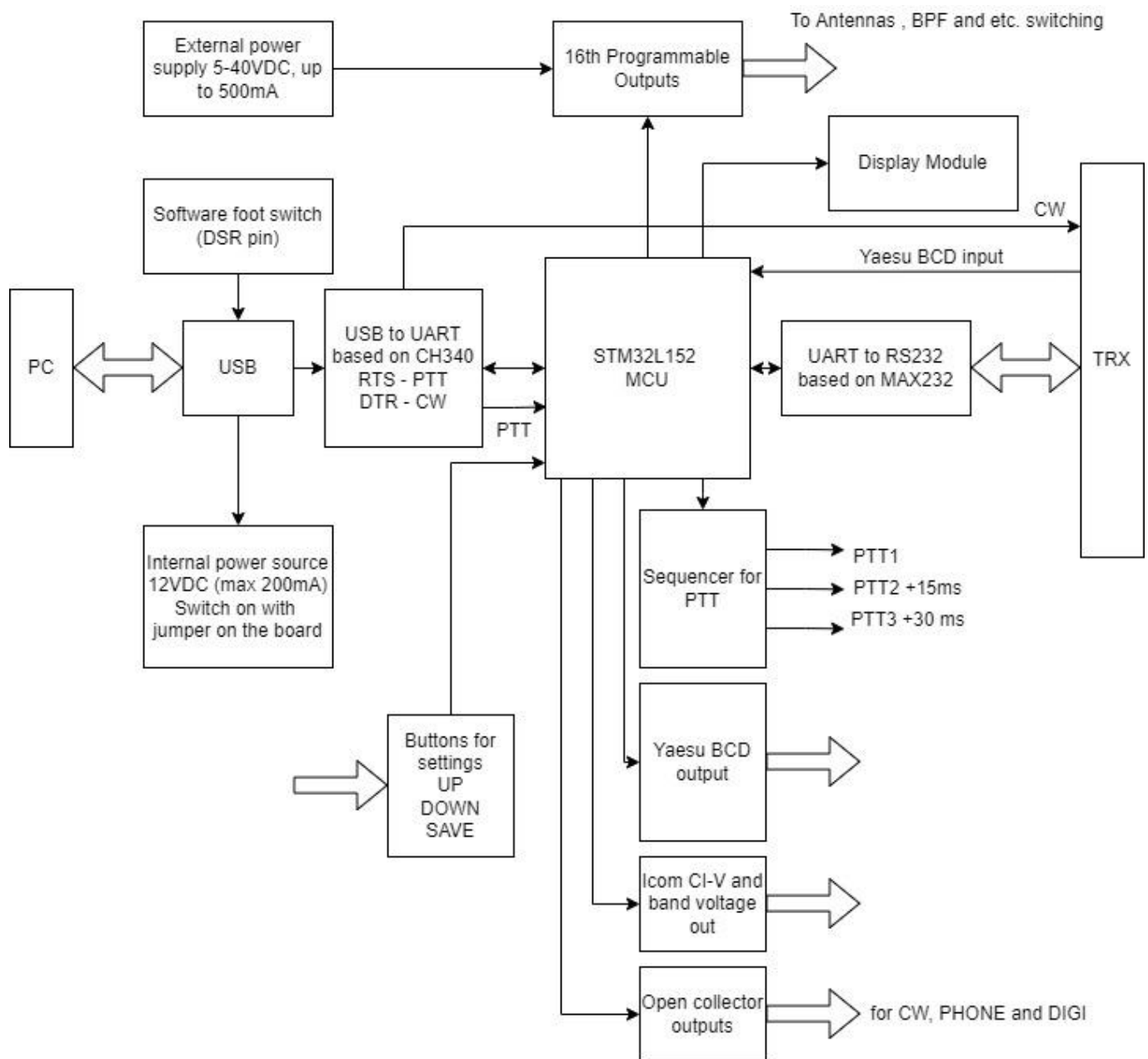


Рис. 1 Diagram of the device

The device connects to the computer with a single USB cable. The microcontroller on the board performs the functions of transmitting data between the transceiver and the PC and thereby receives data on the state of the transceiver, frequencies and modulation type. Further, the device generates all the necessary signals at its outputs, while the data exchange between the programs running on the PC and the transceiver does not stop.

The device consists of two boards - the main board and the display module board. The boards are connected by a cable and a 16-pin connector.



2. Description of input and output signals

Top to bottom sequence.

INPUTS:

- **GND** – common ground
- **IN_V** – the input for connecting an external power source for switching external circuits. This voltage will appear on outputs A1-A16. Range from 5 to 40V (maximum current up to 500 mA)
- **FS** – Foot Switch input. Active state is GND.
- **SAVE** – Push Button input. Active state is GND. See below.
- **DWN** - Push Button input. Active state is GND. See below.
- **UP** - Push Button input. Active state is GND. See below.
- **BAND** –Band voltage input (ICOM)

OUTPUTS:

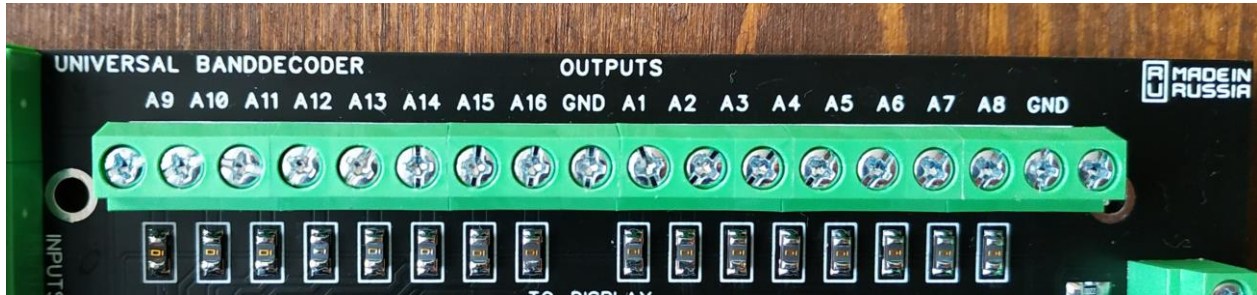
- **GND** – common ground
- **CIV** – output ICOM CI-V
- **PTT3** – Sequencer output PTT3 (delay 30ms)
- **PTT2** – Sequencer output PTT2 (delay 15ms)
- **PTT1** – Sequencer output PTT1 (without delay)
- **CW** – output for CW manipulation
- **DIG** – open drain output which turn on in DIGI mode
- **CW** - open drain output which turn on in CW mode
- **PH** - open drain output which turn on in Phone modes (SSB, FM, AM)
- **BAND** – Band voltage output (ICOM)

Band voltage ICOM:

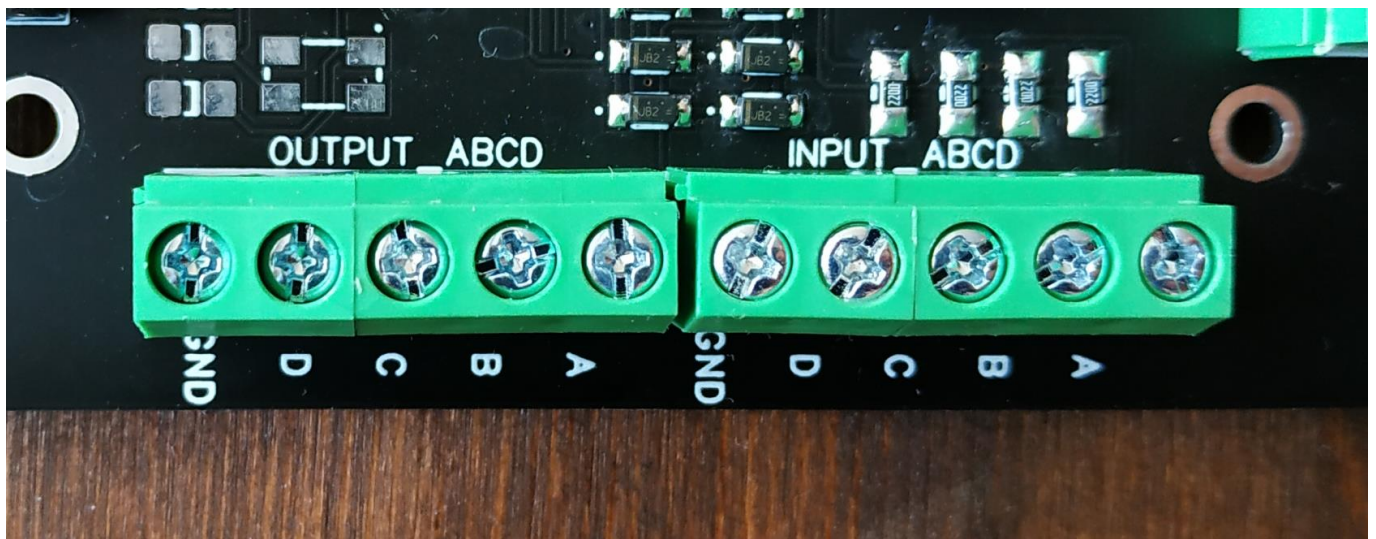
Band	160m	80m	40m	30m	20m	17m	15m	12m	10m	6m	None
Frequency	1.8	3.5	7	10	14	18	21	24	28	50	NA
Icom Voltage	7.0v to 8.0v	6.0v to 6.5v	5.0v to 5.5v	0.1v to 1.2v	4.0v to 4.5v	3.0v to 3.5v	3.0v to 3.5v	2.0v to 2.5v	2.0v to 2.5v	1.2v to 2.0v	0v
Yaesu Band A	H	L	H	L	H	L	H	L	H	L	L
Band B	L	H	H	L	L	H	H	L	L	H	L
Band C	L	L	L	H	H	H	H	L	L	L	L
Band D	L	L	L	L	L	L	L	H	H	H	L



Outputs for external circuits:



Input and output of Yaesu BCD band data. Signals are generated at the output regardless of whether or not the BCD input signal is enabled. The output is generated based on the data received by the device during data exchange between the PC and the transceiver.



3. Connection between PC and TRX

The device is connected to the computer with a single USB cable (USB type B connector). A new COM port will be detected in the system, which must be used in the settings of programs for working with the transceiver. The speed is 9600 kb/s, the same speed must be set in the transceiver settings.

The device is connected to the transceiver via the DB9F (RS232) connector. The device only supports Kenwood's CAT protocol. If you have a transceiver with a different communication protocol, or you do not want to use this interface, you can use the Yaesu BCD data or ICOM band voltage data inputs. In these cases, the device will not be able to obtain information about the exact frequency and type of modulation. It is not necessary to use all inputs at the same time.

4. External devices connection

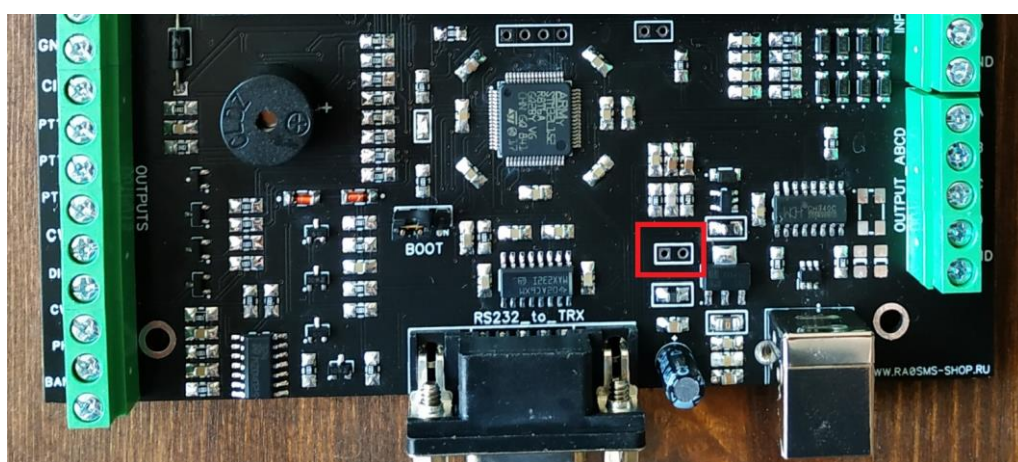
To save the settings of the outputs A1-A16 by bandes, it is necessary to connect 3 buttons without fixation to the device board - UP, DOWN and SAVE (the active state is closed to a common wire). The settings are saved independently for the receive and transmit modes. Thus, it is possible to configure



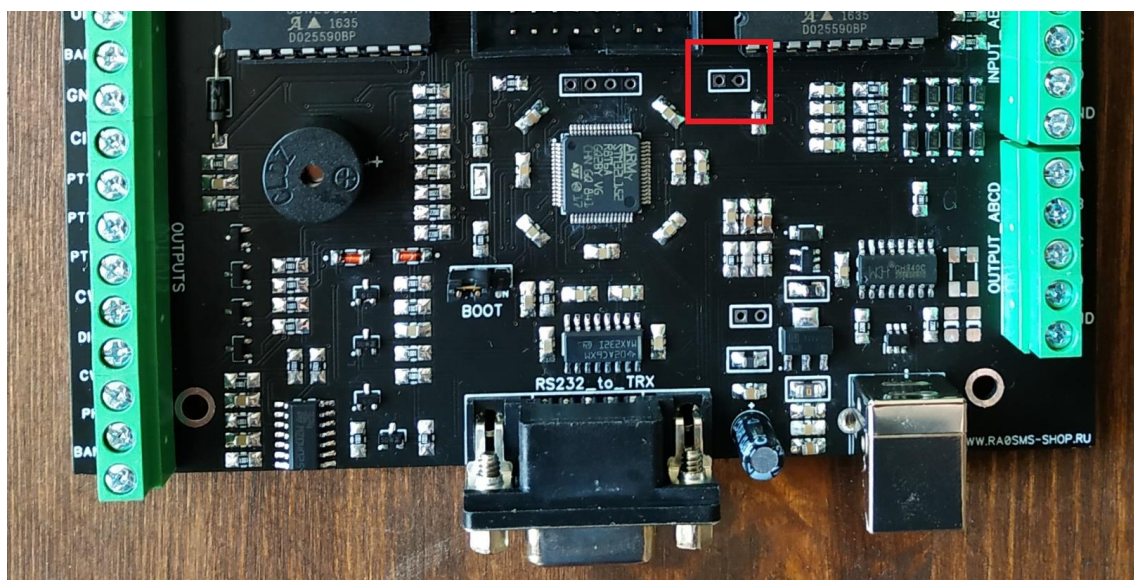
different outputs to be switched on independently in receive mode and in transmit mode. For example, when operating on 80 meters, you want to transmit to the antenna on port A1, and while receiving, listen to another antenna on port A2. This switch will take place automatically.

The setup procedure is as follows. When changing bands in the transceiver, the device determines the current active band, the desired output A1-A16 is selected with the UP or DOWN buttons (they switch in a loop). After the desired output is selected, you must press the SAVE button, after which the selected output will be saved for the current range (a sound signal will inform you about the successful saving of the settings). For the transmission mode, everything is the same, but the selection of the antenna and the saving of parameters must be done with the pedal depressed (the FS input is closed to a common wire).

If you plan to use the outputs A1-A16 for switching loads with a voltage of 12V and a current of not more than 200 mA, it is possible to use an internal voltage source. To do this, you need to install a jumper on the board.



To connect a software-defined footswitch (DSR input), use the input marked in the figure:



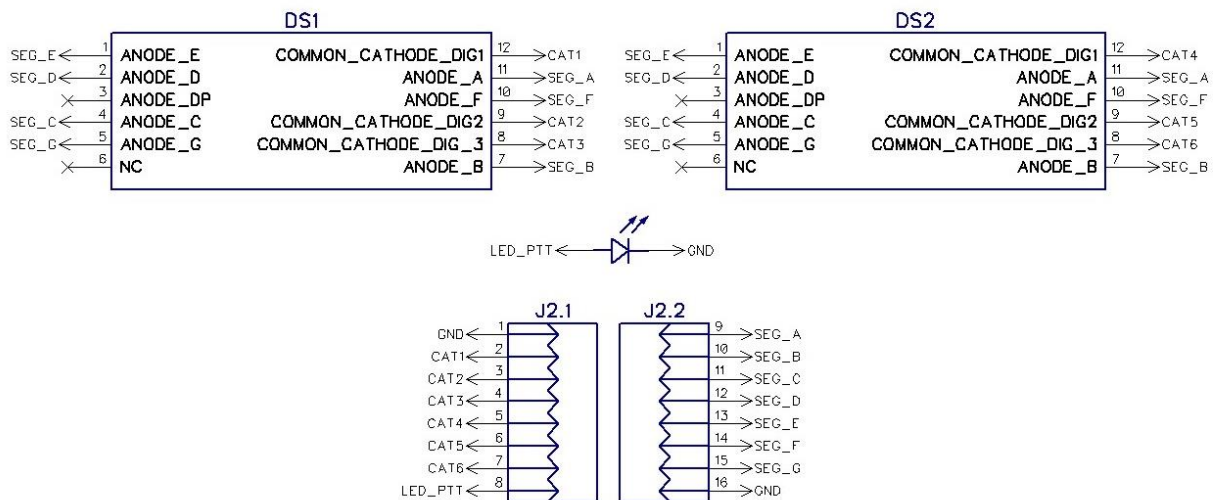
5. Schematic diagram and dimensions

Main PCB – 130*85 mm

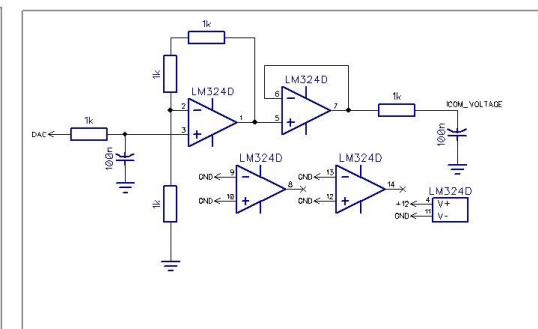
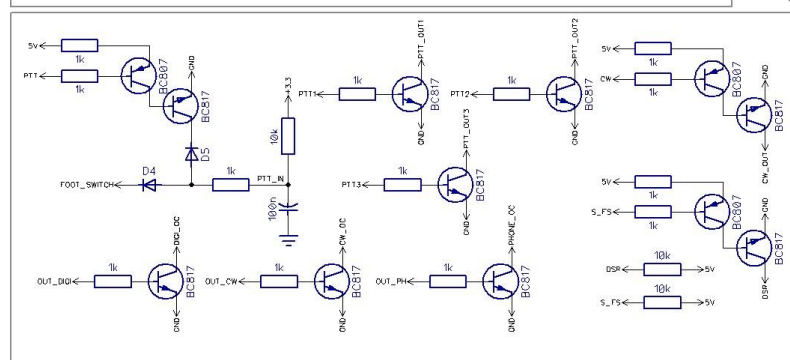
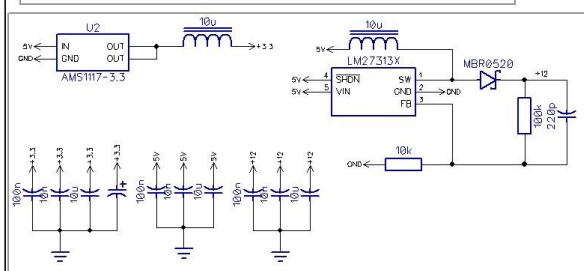
Display module PCB – 90*40 mm

Display (6 digits) – 75*20mm

DISPLAY MODULE 6 DIGITS (COMMON CATHOD)



Schematic diagram of the display module and its appearance



Size		Rev
A3		0.1
20 Aug 2021	RA0SMS	
	1	

