
REMULTIPLEXOR 5 ASI/ASI

Multi functional remultiplexer for transforming of 5 digital ASI streams into the signal of DVB-C format with possibility of reconstructing of the output frequency.

User's Manual

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1 DESCRIPTION

Multifunction device (further to on a text there is Converter) intended for realization of the digital television broadcasting on the existent networks of multichannel cable television.

A converter allows to form from given on his 5 entrances of digital streams of ASI the required package of digital softwares and to give out this package on one subbearing in accordance with the standard of DVB – C. A signal from the output of Converter is given on an entrance PCH channel keyer of the head station of cable television.

The use of Converter is possible joint with the equipment of analog cable network with the simultaneous broadcasting in one network of both analog and digital signal..

As takers-offs the use of standard receivers of digital television is possible.

Dear users!

We perfect the equipment and software constantly, therefore turn your attention that, some update versions of software can not support the early produced equipment. It is related to the use in the equipment of more modern technical decisions and new element base.

In connection with the constantly conducted work on the improvement of device, some disparities are possible between description and concrete good.

All of software is passed to the users on principle «as is». Information, allowing to adapt the system of the address encoding to the present for an user system of account of subscribers, can be passed on demand.

Clarifications and last versions of software can be got for a salesman

1.1 Basic functional possibilities

- Remultipleksirovanie of input digital streams - forming arbitrary package of softwares from transferrable in 4 digital ASI streams.
- Amount of the programs translated in the output signal of Converter determined by the operator of cable network within the limits of stream, skipped Converter (for QAM64 with a stream less 40.5 Mbit/sec in cut).
- The program is an analyzer of digital streams, enters in the complement of delivery.
- Choice of modulation of output signal of QAM64/128/256
- Possibility of setting of frequency of output signal in a range from 4 to 40 Mhz.
- Support of the system of conditional access. Built-in block of closing ductings from an unauthorized division, provides possibility of the use Converter in the address system of conditional access of DVCrypt (CerberCrypt)
- Tuning of parameters from the personal computer by means of entering in composition of supplying with the specialized utility
- One Converter is provided by a selection from 5 digital streams of ASI a to 14 TV programs which are passed on one bearing in a digital kind in accordance with the standard of DVB -C in a spectrum breadthways to 8 Mhz.

1.2 Technical descriptions

- A type is modulation of output signal QAM 64 /128/256
- Maximal total job output stream (at QAM64) 40,5 Mbit/sek
- Bar of frequencies of output signal of DVB-C less than 8 Mhz
- Level of output signal (PCH) 20dBmW+/-5dB
- Range of alteration of frequency of output signal 4,0 – 40.0- Mhz
- Sockets entrances of ASI BNC .
- Will eat away a weekend F
- Feed 220V+/-20%
- Watts-in <30Wt
- Sizes 19", 1U 480*45*180 MM,

2 ● Weight 3,5 Kg Connecting



2.1 Connecting to the electric network

“220 V 50 Hz” is the Network socket, corresponds the network cable of standard of MEK. Connecting must be carried out to the wall outlet, to having the third earthing contact for connecting to the contour of the protective grounding.. For connecting there is the special screw-bolt to the contour of the technological grounding. It is recommended to connect a device to the steady-state network or through the trouble-free power module, for the exception of influence.

Attention! Exploitation of device is forbidden without connecting to the contours of the protective and technological grounding.

2.2 Connecting of entrance signals

“IN1 – IN5” Connecting of 5 digital streams of ASI. Sockets of NBC

2.3 RS485

Two sockets for connecting of Converter (or systems from a few Converters) to the computer for tuning and work in the system of conditional access. Work in the system is carried out on RS485, Because does not have the serial Personal computers port supporting the interface of RS485, connecting to the personal COMPUTER is carried out through incoming in the complement of delivery transformer . A transformer has two sockets. One – DB-9 is connected to the socket of RS485 on the backplane of Converter, second connected to the socket of USB of the personal COMPUTER. In order that, utilizing the interface of USB, to work on protocol of RS 232 on the personal COMPUTER it is needed to start an utility, emulating COM port.

For work on the interface of RS485 every Converter at adding to the system gets the number. The appropriation of number in the system is carried out by means of the incoming in the complement of delivery program and made consistently, at first to the personal COMPUTER the first Converter is connected and registered in the system, after he is disconnected and connected the second et cetera to the last.

Since all of converters are incorporated in the system, all of them unite between itself and personal COMPUTER on RS 485 consistently . Personal COMPUTER to the first socket of RS485 on the backplane of one of converters. Second socket of RS 485 this Converter unites with the first socket other and тд. The last free socket of the last in the system Converter loads up on a co-ordinate loading .

Procedure of connecting of Transformers in the system is resulted in description of Program DV-Crypt (CCrypt).

2.4 Output signal.

F OUT is a digital output signal of format of DVB-C on subbearing 4.0 – 40.0 Mhz in a range . Socket of type of F. Level of output signal of $20\pm 5\text{ dB}$, other size can be stipulated at an order.

ATTENTION!

- 3 All of connecting of videosignals it is necessary will make sure that a screen of the connected video of cable is not under potential in relation to earth of device. To make connecting at presence of the protective and technological grounding, both device and connected devices.

4 Work with Converter

Work with Converter is begun with his connecting to the contour of grounding and to the feed-in network of 220B, 50 Gc– proper will eat away terminal on a backplane.



The signals of ASI are given on entrance of IN 1 – In 5 are sockets of BNC.

An output signal is taken off from the socket of type of Af and given on the entrance of intermediate-frequency of channel keyer.

For tuning of parameters and connecting of Converter in the system from a few devices, there are two sockets of DB9 on a backplane. To one of these sockets, through incoming in the complement of delivery transformer USB / RS485 is connected the personal computer. During work of Converter in the system from a few devices, to the second socket of RS485 other Converter is connected.

There are 8 light-emitting diodes on the front panel of Transformer (on the number of entrances, индуцирующие the presence of entrance signals and red light-emitting diode of OWERFLOW, индуцирующий exceeding of total volume of the chosen input streams of maximally possible stream in 40,5 áàèð/ñâê. (for QAM 64)

At including of device on a few seconds all of light-emitting-diode indicators catch a fire on a facial panel.. In 5 - 10 seconds there will be to shine light-emitting diodes of those entrances on which ASI is given streams..



The converters of DVB-C have the embedded system of synchronization of system time. A control computer is synchronized from the source of time-signal. A computer, connected to the converter, synchronizes a converter, a converter is given out by a signal synchronizations which a receiver is synchronized. At disappearing of signal of synchronization all of the system will work, but to show incorrect time. In the program DVCrypt it will be reflected in the “magazine of work of server”

4.1 Tuning of parameters.

Tuning of parameters of Converter is carried out by means of utility, entering in the complement of DVCCrypt(CCrypt).

Program of work with ASI enters entrances in the complement of DVCCrypt(CCrypt). Procedure of choice of the programs from 5 digital ASI streams is resulted in description of the programs we DVCCrypt(CCrypt)


Tuning, related to the block of conditional access resulted in description of the program DVCCrypt(CCrypt)

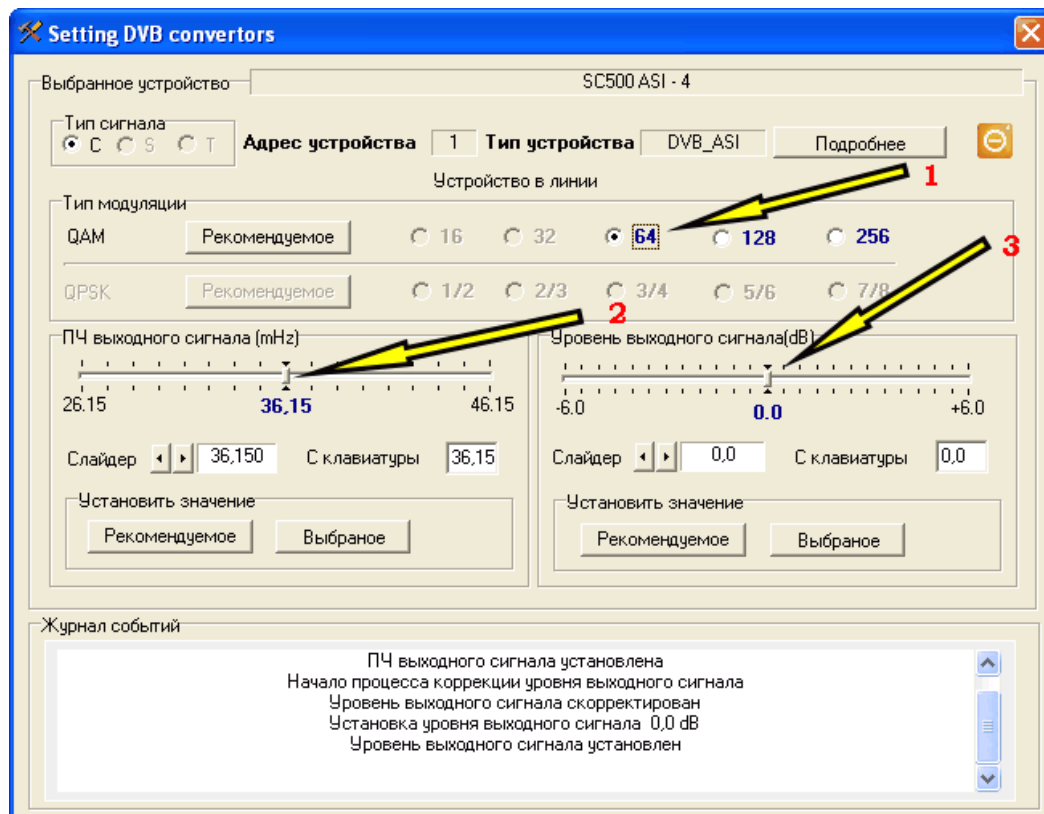
4.1.1 Alteration of frequency, typeselection modulation and level of output signal.

For alteration of frequency of output signal it is necessary to execute the followings actions :

- i 3.1 agrees to carry out connecting
- To include Converter
- To start the program DVCCrypt. Will set a converter in the system, because it is expounded in description of DVCCrypt. Since a converter will be set in the system of, выбрать on the bar of tools



By a mouse icon with a mark  to start the программы tuning of converter



Ris.2

- After the start of the program it is necessary to push the button in the right overhead corner of window, that will allow to set program connection with a converter and activate functions

regulations which are possible for this type of converter.

- By радиокнопка (1) choose the necessary type of modulation of QAM. By default it QAM 64

With a help (2) utilizing slider or entering the necessary value of frequency within the limits of 26.15 – 46.15 Mhz in a window from a keyboard, push the button and the chosen value it will be written in. By default it is a value 36.15 Mhz.

For setting of necessary level of output signal (3) by slider or entering the necessary value of level in a window scope +/-6db we push the button and save the chosen level of output signal. By default this level of 0db.

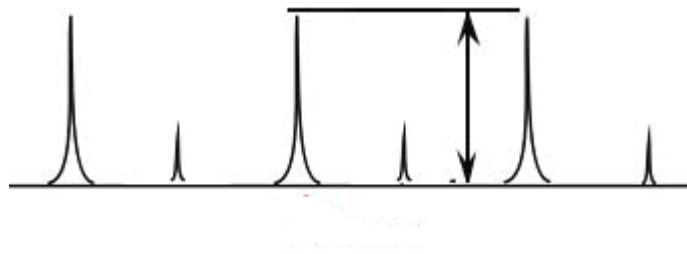
Pressure of the button allows to return the default value of parameter. The magazine of events in the underbody of window reflects all of the conducted operations

4.2 Setting of level of digital signal.

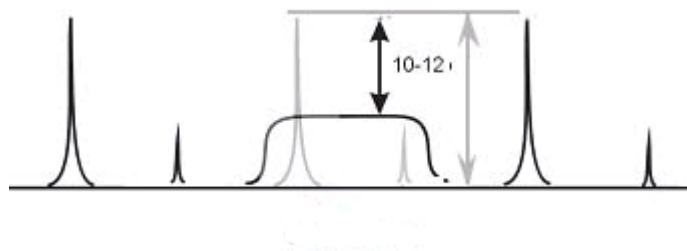
Setting of level of digital signal in a group spectrum is carried out regular facilities of transmitter apparatus of network. Controlling the level of digital signal a spectrum analyzer, it is necessary to propose him on 10-12 dB below, than level of limitation of highway for an analog signal..

Tuning.

1. To measure the level of output analog signal of channel keyer in a network in the regular mode, without a digital signal.



2. To connect to the network a channel keyer with given on his entrance PCH by the output signal of Transformer
3. To set the level of signal on the output of channel keyer on 10 -12 dB below, than measured in a point 2).



A level is determined on the level of middle of bar of digital signal.

4.3 Tuning of receiver of standard of DVB -C .

Tuning of receiver and work with him is carried out in accordance with instruction on exploitation of receiver.

1. In the menu of receiver of Tuner& Channel it is necessary to set the followings values of parameters:

Frequency $F = \text{bearing} + F_{\text{пч}} \text{ МГц}$
 Where $F_{\text{несущ.}}$ - frequency of channel
 $F_{\text{пч}}$ - intermediate-frequency of converter
 Demodulation QAM
 Input Symbol Rate 5400Ms/s
 Constellation 32

We turn Your attention, that tuning of receiver is made not on frequency of bearing channel, but with a change on Fпч мГц..

5 TECHNICAL SERVICE

Technical service is provided by control of the technical state of device, supporting him in the in good condition state, and warns refuses in the process of his exploitation.

Technical service is made an auxiliary personnel.

The results of technical service are added to формуляр.

Periodicity THAT and time, necessary for his leadthrough resulted in òàáë.2

Table 1

Содержание работ	Периодичность выполнения работ	Время, необходимое для выполнения работ, мин.
1. Внешний осмотр, очистка вентиляторов и внутреннего пространства корпуса от пыли проверка отсутствия механических повреждений, надежность крепления кабелей к разъемам РТО	1 раз в 12 месяцев	20

6 RULES OF EXPLOITATION. REQUIREMENTS OF BEZOPASTNOSTI

During setting of device and in the process of exploitation the elementary rules of exploitation of difficult electrical engineering devices are observed (presence of the protective and technological grounding, connecting to the device of devices, having a with him unibus of grounding, application of anti-static coverages in an apartment, where a device is set, an optimum temperature condition and ò. of ä is provided).

To exploitation of wares persons, acquainted with instruction on exploitation of wares and passing instructing on accident prevention, must be admitted.

For providing of safety of auxiliary personnel in devices foreseen: 3 - pole fork with the earthed wire, connected to the contour of the protective grounding; lids, closing токопроводящие parts with dangerous tension.

On the corps of good there is a terminal for connecting to the contour of the technological grounding.

- Wares must be connected to the feed-in network 220Â50 Hertz through the devices of trouble-free feed (UPS) with the function of autotransformer
- A reliable earthen tire must be well-to-do in a working apartment.
- All of devices, having a terminal «Earth», must be connected to the tire of technological заземления, for every device a separate wire must be utilized.
- For connecting of powerful users of electric power a separate power network must be utilized.

In the process of exploitation:

- Nedopuskaetsya to expose to wares influence of surplus heat and humidity.
- After transportation in winter terms before plugging in a network it is necessary to warm up wares during 2 –3 clock.
- Apartments wares are set in which must have anti-static coverages.
- An optimum temperature condition must be provided in apartments.

7 Nadopustimo hit into the corps of moisture, acids, lyes and solvents.

8 POSSIBLE DISREPAIRS AND METHODS OF THEIR REMOVAL.

Possible disrepairs and methods of their removal are resulted in a table 3.

Table 3

Sign	Additional sign	Possible disrepair	Methods of removal
There is not a signal on the output of device	Light-emitting diodes do not burn «Network» and level of entrance signals on a front panel	A safety device is burnout 220 In, 0,5 And	To replace safety devices
There is not a signal on the output of device	Light-emitting diodes burn «Network» and level of entrance signals on a front panel	precipice of cable to the transmitter apparatus	To replace the damaged cable
On a receiving end absents signals of a few ductings	The light-emitting diodes of indication of presence of digital stream do not burn on one of 5 ASI of entrances.	ASI is not given signal on the entrance of device	To check up the presence of signal on the entrance of device.

9 COMPLETE SET OF DELIVERY

Table 2

N İ / ĩ	Name	Amount	Overall sizes mm	Mass kg	Note
1.	5 TS MPEG2 ASI-DVB-C Converter	1	180Ö440ö45	3,5	
2.	Cord of feed	1	L = 150		
3	Technical description	1			On CD disk

9.1 Guarantee obligations

The manufacturer guarantees the efficiency of the unit according to technical requirements with condition of observing the rules of exploiting described above during 12 months from the date of selling to the final user.

During the guarantee time the owner has a right for the free technical maintenance of the unit, and in the case of break down – for free repairing or exchange. Repairing of the unit is done on owner's cost during the guarantee time in case if the unit was broken down due to incorrect exploiting.

The manufacturer receives his equipment for repairing notwithstanding where, when and by whom it was sold.

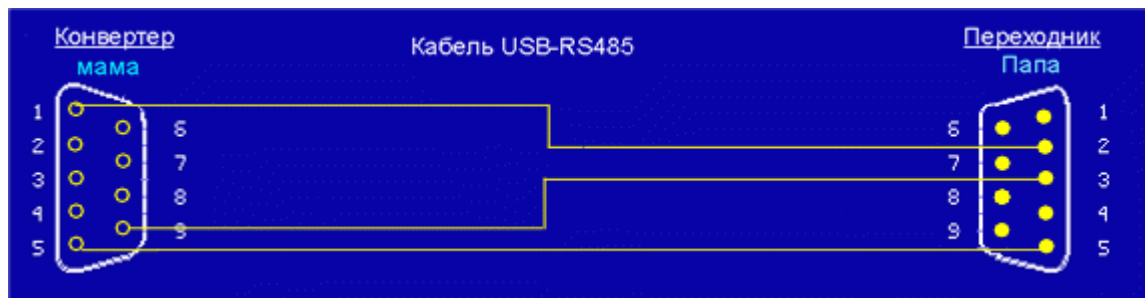
Software, which is supplied with the unit, is manufactured according to the principle «as it is» if nothing special was talked over. The firm – manufacturer isn't liable for the consequences of the program usage. Software can be used without any limits. Originals codes of programs can be send on demand.

It is supposed that in process of the issue modernisation of the unit will take place, taking into consideration the wishes of the orderer. There is a possibility of fulfilling work on the separate order.

Because of the continuous perfecting of the device some discrepancies between the description and the concrete device are possible.

10 APPENDIX

10.1 *Raspayka of cables for connecting of Converters*



For connection of Converters a cable is utilized with the sockets of DB9

10.2 Adding of new converter to the system.

Adding of converter to the system is carried out by means of the program DDCrypt (CCRypt) /

Attention! Adding of new converter to the system it is necessary to carry out only disconnecting the reducer of RS232-RS485 from the workings converters (preliminary turning off the personal COMPUTER) connected to him

Connecting

For the receipt of the capable of working system, it is necessary to carry out connecting of all of Converters to Server and registration them in the system. In the prepared system all of Converters are connected to the system simultaneously. Primary installation of the system is carried out successive connecting of Converters. Adding of new converter to the system it is necessary to carry out only disconnecting the reducer of RS232-RS485 from the workings converters (preliminary turning off the personal COMPUTER) connected to him

The simultaneous connecting of all of converters to one computer is carried out on the chart of editing OR (RS-485). Because in a standard computer port of RS485 absents, for connecting of Converters to Server a reducer is needed with RS-232 on RS-485 (it is supplied with wares). Output of management first connected to the entrance of the second, output of second on the entrance of the third et cetera

Sequence of executions at adding of Converters to the system.

Attention! All of the sectional connecting to the personal COMPUTER it is necessary to make at the turned off and earthed equipment

Attention! Adding of new converter it is necessary to carry out to the system, as follows. Addition of new converter is possible only then, when he **one** is connected to the computer. For this purpose it is necessary the cable of RS-485 going from a computer to the first converter to disconnect (thus disconnecting all of converters from a computer) and to connect this cable only a candidate on connecting System automatically appropriates a number a new converter and watches after the numbers of converters in the system.

It is necessary for this purpose:

- To connect Converter through the reducer of USB/RS485 (one reducer on the system, enters in the complement of delivery) to the computer.
- To include Converter
- To start the **Management** program. To choose an icon Converter, a window will be opened Converters,

and then icon **+** and далее

- To follow pointing of Master of setting of converters.

After finding out Converter the program of tuning will represent the found device in a window «Converters» of [management Program](#) .

- Double click on the number of converter causes a program window the left mouse button with by information of tuning of converter, where it is necessary to specify the name of ductings given on the entrance of this converter and frequency which a converter works on.
- To repeat all of points of section 5.1.2 by turns for all of present Converters.

Since all of Converters passed procedure of addition, it is necessary output of management first to connect to the entrance of the second, output of second on the entrance of the third et cetera In the last free nest of RS485 it is needed to insert loading 300 Ohm (included in the complete set of delivery).

Attention! After addition and tuning of new converter (status of converter - OK) it is necessary to clean memory of receiver, make the scan-out of all of ductings and memorize all of tuning.