Dear User,

as we write in several places: setting and configuring digital systems and their system-components is a very complex task, and all parameters (IP address, port number, mask, gateway, frequency etc.), all operation modes (unicast, multicast, packet format, packet size, modulation mode etc.) and all associated information (PSI tables, identifiers, PIDs, descriptors etc.) must be set exactly up to the last bit, in order to get operation at all. If any of them is set incorrectly, the system will not work, it will seem to be dead.

The configuration procedure of the particular system-components is described in-depth in the instruction guide (Help file) of their software, and after studying it thoroughly the configuration can be performed quite simply. However sometimes occurs that the (mainly beginner) user comes to deadlock.

From such repeatedly occurring typical cases we compiled a FAQ section. Prior to being annoyed for a longer time it is practical to scan through the "cases" in this section: the solution may be given here.

Of course we are further on at our users' disposal in e-mail, with direct control (by remote desk, VNC etc.) or even with personal consultation.

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1 No communication with the device

After a certain program step the user cannot communicate with the device any longer, and the device seems to be defective.

Inspecting the device with Ethernet analyzer it can be found that now and then the device sends out a message, even its IP address can be read out, but the device does not response to the Query messages. At the manufacturer's premises by reading out the content of the internal EEPROM it could be found that the user set the TS Port Interval to 8000 to 65535.

Reason for the error, solving the problem:

The user made no error since the TS Port Interval is allowed to be set to 8000 to 65535, but he did not take care of the fact that in default setting the SW-4901 software uses port 56940 to communicate with the device. Since the high-speed input selector of the Gigabit Ethernet Controller sends all UDP packets arriving in the TS Port Interval to the TS processor, and sends only those to the device controller, which arrive at ports outside this interval, the device controller has not received a single instruction ever. This was the reason for it could not be programmed.

The error would not have occurred if in the SW4901a.ini file of the SW-4901 software the user had modified the communication port from 56940 to a value below 8000 (e.g. portCom=7500).

A fragment from the SW4901a.ini file where the modification should have been made:

[Project]
Project Name=Gigabit Ethernet Controller V1.01
Date=2008.04.10.

[IP Address]
Up-Down IP-4=101
Use CW-Net=1
portTS=59940
portCom=56940
New IP=   10.123.13.102

After changing in the ini file the portCom to e.g. 6940, then running the SW-4901 software and setting the IP address of the device, the device does respond immediately. The following screenshots illustrate the above explanation by showing the concerned settings.

The portCom value can be modified also from the General Device Controller page by typing the value in the Communication Port Number box. After having typed do not forget hit Enter! The software writes this value in the ini file, too.
Note, the software accepts only values within the interval set in the Network Setup page.
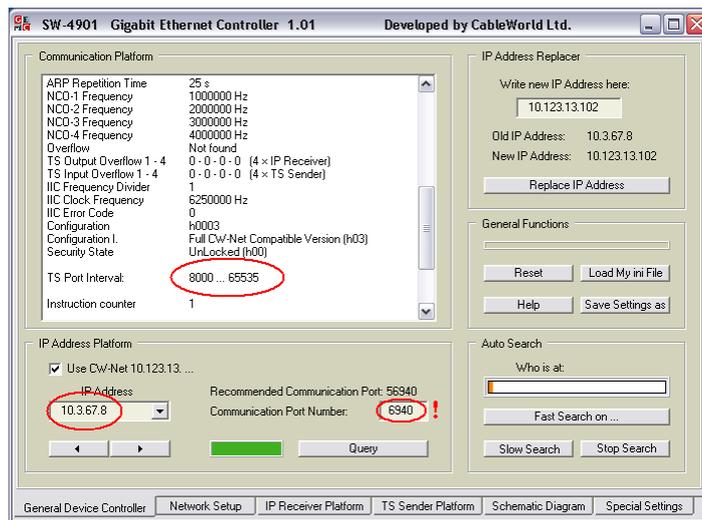
Remark: The SW-4901 software – as shown in the next screenshot – gives a warning after typing the values 8000 and 65535, and indicates the possible new port of communication.
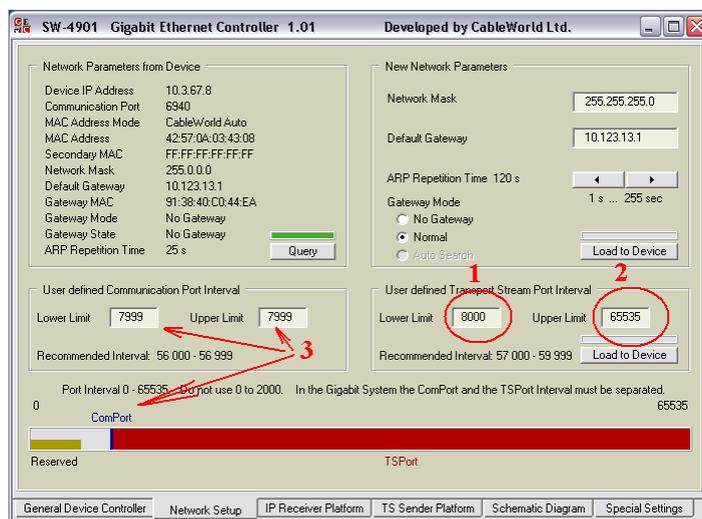
If the given application permits, it would have been more practical to set the TS Port Interval to 8000 to 55000, because in this case the portCom value in the ini file would not have needed to be changed. This way of setting is shown in the next screenshot.
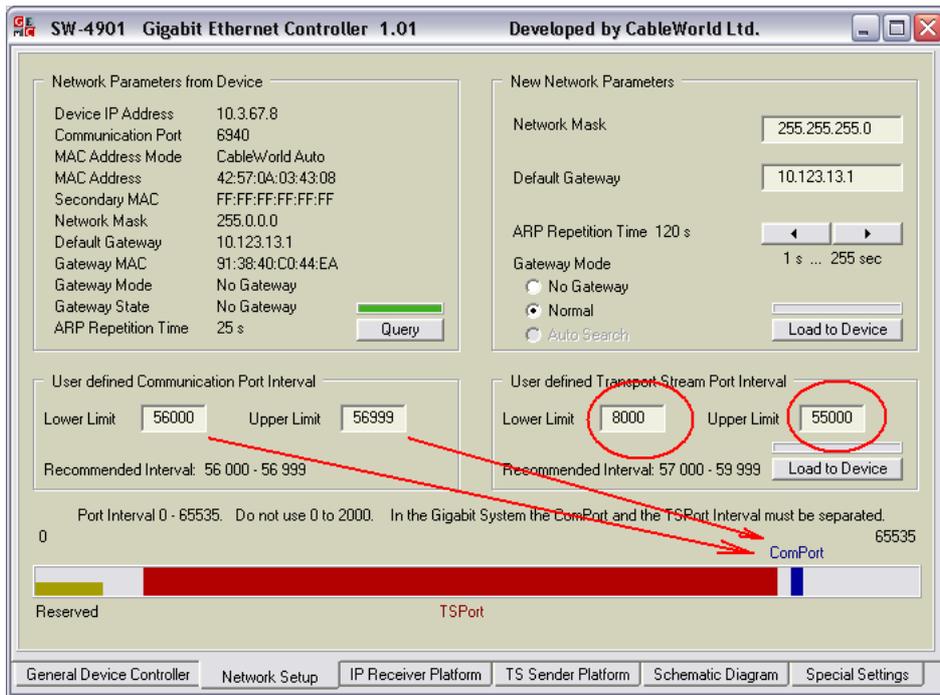
Remark: In the default setting the CableWorld software communicate with the device in one of the 56.9xx ports.

As the third solution the communication is located above the 8000 to 59999 TS Port Interval. Of course the ini file needs to be modified here, too.
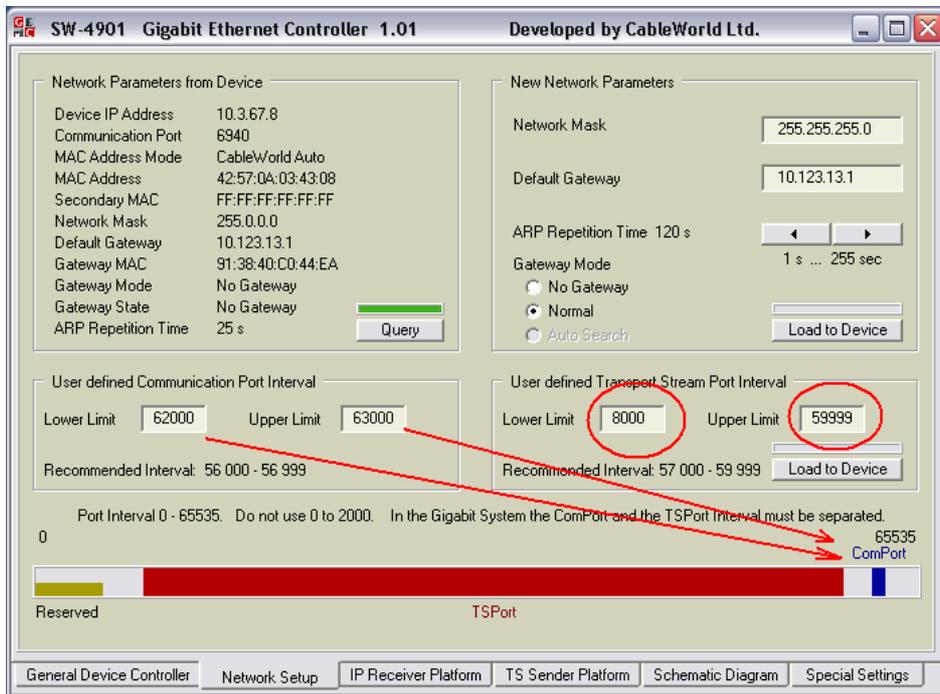
Note:

If at some similar programming error no solution can be found, as the last possibility restore the factory settings. For this, switch off the device, open its cover plate, connect to ground the test point given in the description of the Gigabit Ethernet Controller Board and switch on the device in this state. On this, the original factory settings get restored.

2 Communication problems with IP-input or IP-output devices

Cumbersome communication with the IP-input or IP-output device, it rarely executes the commands

The gigabit devices are prepared to receive and process the high-speed input TS packets in a certain range, in the TS Port Interval only. Each of the IP data packets arriving within the TS Port Interval will be led to the high-speed TS processing unit without any examination. The packets arriving outside this range will be regarded as communication packets and will be led to the low-speed microcontroller for processing.

The error in question will occur if at the input of the device a transport stream arrives with port number out of the TS Port Interval. This TS will be led to the communication channel, and the low-speed microcontroller here will be overloaded because of the large amount of arriving TS packets, thus it cannot process a large part of the received packets. The next figure shows this case: TS Port Interval of the gigabit device is set to 57000 ... 59999, but a TS arrives at the input out of this range, at the port 3500, thus impeding the communication with the device.
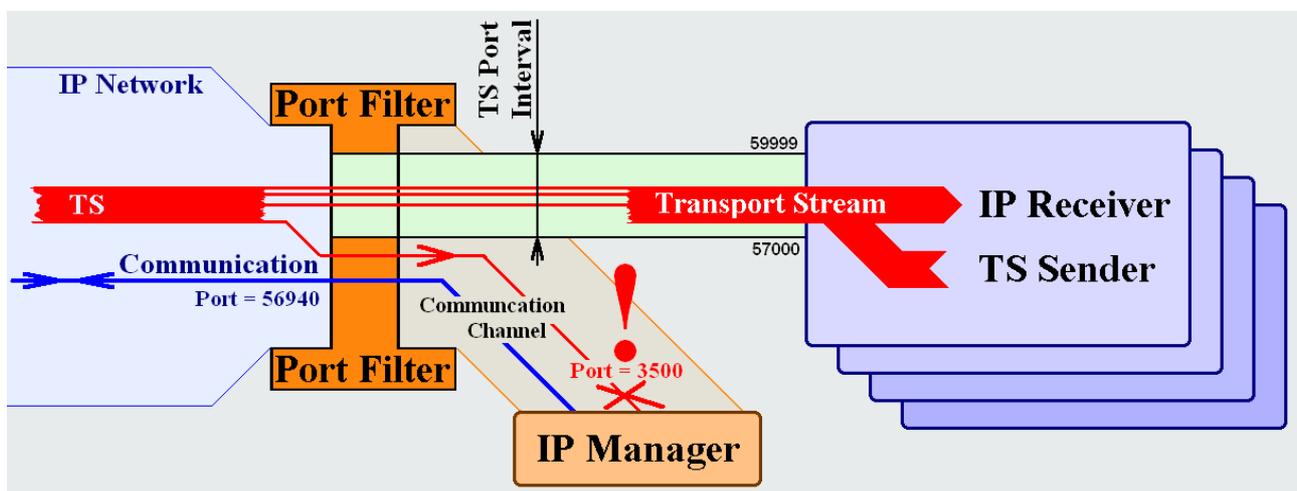
The way of solving the problem can be easier or harder depending on its source. If the IP receiver is disturbed by a TS arriving from outside, remove the TS from the input (e.g. by disconnecting its connector), and reprogram the TS Port Interval using the SW-4951 software. After this the device will be ready for communication again.

Troubleshooting is much more difficult, if the device disturbs itself with the transport stream sent out (e.g. because it returns from the switch). This trouble mainly occurs at satellite receivers, but may occur at MPEG-2 Encoders, too. In the first step try to reduce the number of sent out packets by disconnecting the antenna signal, and if succeeded, stop sending out TS. After having stopped sending out TS, the communication recovers immediately, and the device becomes programmable again. At devices where the number of sent out packets cannot be decreased (e.g. MPEG-2 Encoder), it is worthy to send out the command for stopping the TS even ten times or twenty times, supposing that one of them will be executed.

If the above do not yield a result, remove the cover plate of the device and disconnect the 16pin connector of the Gigabit Ethernet Controller TS input (this will stop sending out the TS), modify the program of the device and then connect the connector again.

As the last possibility restore the factory settings. For this, switch off the device, open its cover plate, connect to ground the test point given in the manual of the device and switch on the device in this state. On this, the original factory settings will get restored.

3 Finding an unknown IP address

How can I use a device, if I do not know the IP address my colleague has set it to?

Devices connected to IP network must be equipped with individual IP address so that communication can be made with them separately. Therefore the first step of installation must be setting the IP address conforming to the given system. In case of borrowed devices or devices which are used by several people often happens that the IP address the device was set to last time is not known to us, thus we cannot communicate with it. The IP address can be read out in several ways, we are going to give advices to find the right way.

The simplest case if we know the first 3 bytes of the IP address (e.g. 192.168.1.xx) and the forth one needs to be found only. Using the search function of the SW-4901 software the value of the fourth byte can easily be found.

If we only know the first byte of the IP address, and the further 3 bytes should be found, the search function cannot be used as it would last very long. In this case connect the device to the PC directly so that other devices do not receive the message, and using the CW-4901 Gigabit Ethernet Contoller software send out in broadcast mode a 'Replace IP Address' command. The 'New IP Address' can be any optional address. If we know that the device may be set to the 192. ...... range, the command sent to 192.255.255.255 will do the job. The 192.255.255.255 IP address has to be typed in the 'Write new IP Address here' box of the SW-4901 software and 'Enter' has to be hit.

Remarks: The 'Use CW-Net' check box has to be unchecked. The most frequently used IP addresses can be read form the drop-down list, too. The message will only travel out of the PC, if the setting of the network mask is correct.

In case of a device at any IP address the solution is sending out the 'Replace IP Address' command to the 255.255.255.255 address, but this message will only travel out of most PCs after modifying the network mask.

As ultimate solution we recommend using the hardware key, which resets the original factory settings. For this switch off the device, remove its cover and with the test point marked in section 4.15 of the Manual (Reset Default Jumper - T) connected to the ground (to the other jumper) switch on the device. The place of the jumper is shown in the next figure.
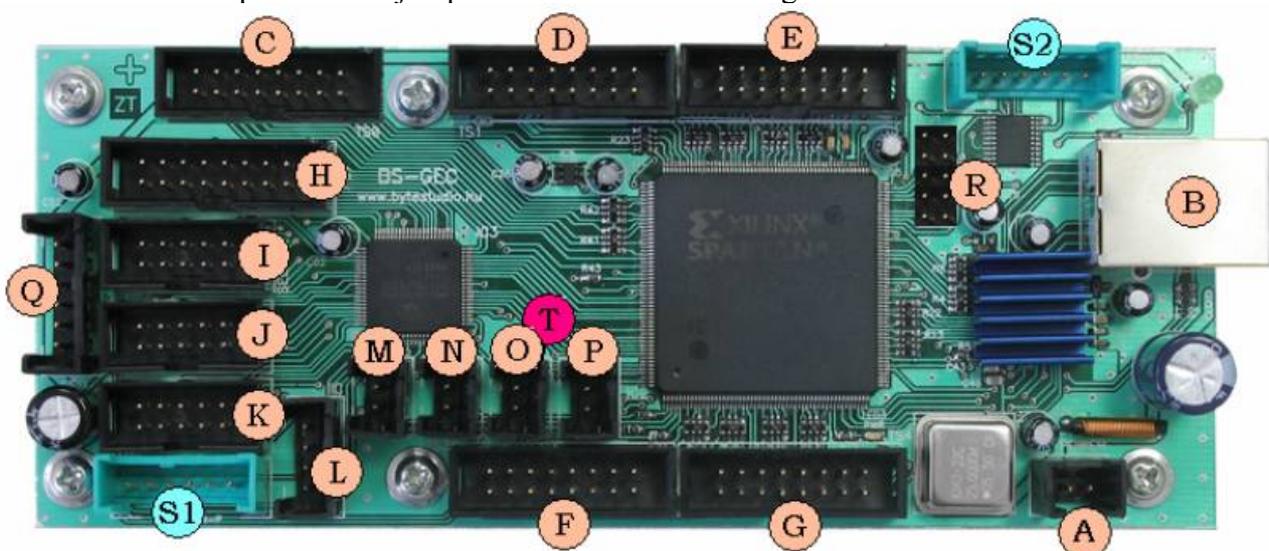
And new a further simple solution. Most of the devices equipped with IP receiver send out IGMP or ARP messages to the network. If any of these functions is activated thus the device sends from time to time (e.g. after powering immediately), from the instruction sent out of the device the IP address can be read out using Ethernet Analyzer (Wireshark).

4   What is the reason for communication problems after reprogramming the IP Address or the MAC Address or re-cabling the switch?

The actual data traffic over the IP network occurs upon the MAC Address. In the switches and in similar intelligent devices that are used for building IP networks, the switch uses a MAC table, and records here via which port with which device it communicated. The content of this MAC table will be refreshed at sending messages, and if no message will be sent out to some device, its address will be erased after a few minutes (typically 3 ... 10 minutes).

The mentioned communication problem occurs if such changes will be done, which the devices cannot take into account. E.g. communication will be made with a device over e.g. port 5 of the switch, and then the cable of the device will be reconnected from port 5 to e.g. port 21. After this no answer will come from the device, because the switch sends the messages to port 5, whereas the device is already connected to port 21. The problem will only cease if the address of the device will be erased from the MAC table and the switch will start searching for the device again. Erasing the MAC table can be awaited with several minutes' patient wait, or can be obtained by switching off the switch and switching it on again after some wait.

On changing the IP Address or the MAC Address, beside the "device does not answer" effect also the "device answers from multiple IP addresses" and the "other device answers from the given IP address" effect can occur. When using multiple switches, multiple MAC tables will decide upon the operation of the system, that is, the situation gets even more complicated. However, in any case the problem can be solved with patient wait or with switching off the supply voltage of the switch.

5   When using devices as TS receivers on the IP network, initially the switch works correctly, and then – as it would have got defective – it starts to broadcast the data stream sent for the particular device earlier.

Upon the initial communication with the IP receiver (e.g. upon its programming) the MAC address of the receiver will be put on the MAC table of the switch, and the system works correctly. Since during operation the receiver needs no communication, it sends no messages to the network, thus after a certain time its data will be erased from the MAC table. After this the switch does not know anymore which of its ports the device is connected to, therefore it sends out the data packets carrying the TS to all of its ports, supposing that over some of the ports it will be able to deliver them to the device.

This effect is a part of the regular operation, that is, no error occurred. This effect can be prevented if the receiver sends without request from time to time messages to the network in order to achieve refreshing its data. In the CableWorld products the ARP Advertisement function serves this purpose: the receiver sends ARP messages again and again indicating to the network "I am here – I am here". In the CW-48xx CW-Net system the repetition time can be set between 16 sec and 240 sec.

6 The IP remultiplexer is specified to process data streams within the Port Offset to Port Offset + 2047 range. Can it process also data streams outside this range?

Yes, the device is capable to process data streams outside the 2048 Port Number values given in the specification, but this is not part of the specification since it requires higher knowledge of the subject.

The CableWorld IP Remultiplexers assign to each TS packet an identifier and the further destiny of the packet depends on the value of this identifier. The identifier is composed of the 13 bits of the PID value, and the 11 LSB bits of the difference of the Port Number value and the Port Offset value. If Port Number values outside the range of the 2048 Port Number values will be used, special care has to be taken of preventing possible conflicts. Possible conflicts in most cases can easily be removed by modifying the Offset Port value.

The foregoing is illustrated on the example of six port numbers:

Port Offset = 20 000

Port 1 = 20 000	Packet identifier = PID + 000 0000 0000	correct
Port 2 = 20 100	Packet identifier = PID + 000 0110 0100	correct
Port 3 = 21 000	Packet identifier = PID + 011 1110 1000	correct
Port 4 = 22 048	Packet identifier = PID + 000 0000 0000	conflict with Port 1
Port 5 = 22 049	Packet identifier = PID + 000 0000 0001	usable, no conflict
Port 6 = 2 000	Packet identifier = PID + 001 1010 0000	usable, no conflict

If the last 11 bits of two identifiers are identical, the packets of these two transports streams will be added within the remultiplexer, and they will be handled as if they would come from the same source.

Note, according to the above mentioned the packets of two or more transport streams can easily be added on the IP network: for this they only need to be sent out to the same port number.
On the other side, packets of two or more transport streams arriving with identical Port number will be added in the IP remultiplexer, they can only be processed, if the PID values are different thus no disturbing PID conflict occurs.

7 In some applications the PSI Inserter of the IP remultiplexer has to be loaded with programs of several Mbytes size. Why is the loading process some times successful, some times unsuccessful?

At designing the IP remultiplexer and other similar devices an important planning aspect was that the device gives priority to the operation process, yet most possible parameters should be allowed to be modified without disturbing the operation of the device. In case of the IP Remultiplexer writing the flash memory with a large amount of data may take several minutes. If during loading IGMP Query or similar messages arrive from the network, the loading may be aborted, since the device gives priority to the request of the network.

Solution: As shown in the figure, the IGMP Query messages arrive from the network in even intervals with repetition time of several minutes. If the loading process is shorter than the repetition time of the messages, after abortion of the loading process the next repeated loading will be successful. If in the opposite case the loading will be unsuccessful, the device has to be disconnected from the network, and the large amount of data be loaded in direct connection with the PC.
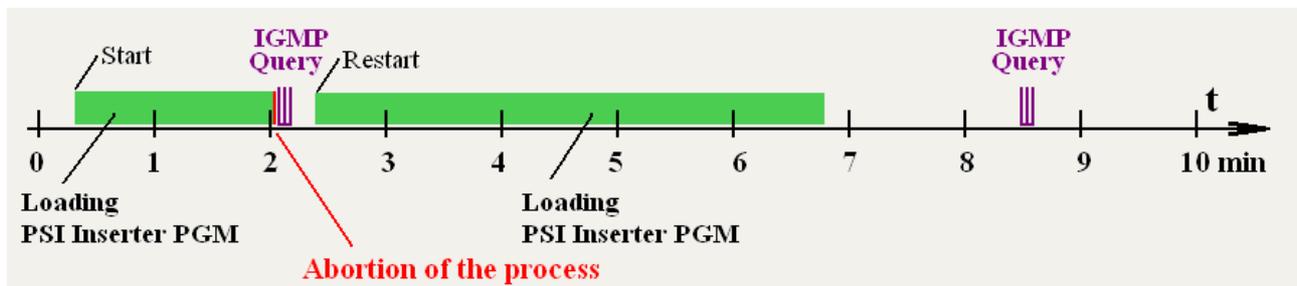
8 How to select a CableWorld ASI to IP converter model for putting an ASI transport stream to IP network? How to transmit the ASI signal over optical cable?

For transmitting the transport stream over either UTP cable or optical cable, first the transport stream packets need to be encapsulated in UDP/IP packets.

CableWorld offers for this job a rich selection of ASI to IP converter models. From this, that one should be chosen which matches the given application best.

The less expensive solution is the CW-4841 ASI to IP Converter, which can put one transport stream to IP network with unicast or multicast connection. For its configuration serves the SW-4841 software.

Note, most of the CableWorld products provide IP converter mode, that is, the user has only to make use of this function: for the CW-48xx series using the SW-4841 software, for the CW-49xx series using the SW-4901 software. Most of these devices are equipped also with a selector, thus the user can select that input or output whose signal should be put to the IP network.

If one of up to 4 or up to 8 ASI signals has to be put to the IP network, e.g. for examination, the TS Analyzer model CW-4814 or CW-4818 respectively can be used.

The CW-4941 ASI to IP converter is a high performance version; it can put 4 ASI signals to gigabit network. For its configuration serves the SW-4901 software.

If 100Base-T format, 1000Base-T format, or the formats 1000Base-XL and 1000Base-XS used at optical transmission need to be converted from one format to one of the others, nothing else has to be done as use a switch which is equipped with such format ports; the switch will perform the conversion automatically.

9 I have to convert to ASI signal transport streams arriving over IP. Which converter should I choose from CableWorld's rich offer?

The IP network transmits the transport stream packets in asynchronous way, therefore the IP to ASI converter has to be selected according to the needs of the device which will process the ASI signal.

If the IP network is used by one user only, the task is simpler, because the user has a hold over both the transmitting side and the receiving side, and the user decides even over the details of the way of transmission. Such networks will be referred to as dedicated IP networks.

If the data stream will be delivered by large e.g. telecommunication IP networks used by many other users too, the transmission may be very uneven (burdened with congestions and pauses) according to the network load. For handling such unevenness, in most cases a device equipped with buffer needs to be chosen.

The simplest one among the CableWorld IP to ASI Converters is the CW-4842, which has been designed for unicast reception, has no temporary store, therefore when putting a UDP packet to the ASI output its input stage can receive a single further arriving packet only.

This device set to continuous mode, in lack of input packets delivers null packets at its ASI output, at the rate of the NCO. When a packet arrives over the IP network, the device puts it to the place of the next null packet. At the output a 64-member PCR corrector corrects the PCR errors up to the value of ± 2 to 3 µs.

When setting the device to transparent mode the null packet inserter is switched off, thus at the ASI output will only appear the packets arriving over the IP network, and thus the ASI data stream will be uneven.

This model cannot handle the IGMP messages; therefore for multicast reception it can only be used with its MAC address re-written to the multicast MAC.

The CW-4843 IP to ASI Converter has been designed especially for transparent transmission; therefore it is not equipped with PCR corrector. The signal at its ASI output can be used for filling a buffer or for driving a TS remultiplexer which contains a buffer memory.

The CW-4944 IP to ASI Converter is a second generation model of this converter series. It comprises 4 unicast or multicast IP receivers, and it handles the multicast network at IGMPv2 level. The 4 channels can be configured very comprehensively, even to transparent transmission. It is not equipped with PCR corrector and buffer. For its configuration serves the SW-4901 software.

The CW-4942 IP to ASI Converter is an upgraded version of the CW-4842, it uses gigabit input module thus it provides multicast reception. This model is equipped with PCR corrector and one ASI output. For its configuration serves the SW-4901 software.

The CW-4952 IP Remultiplexer can perform the function of a professional IP to ASI Converter; it produces 4 ASI signals from the input IP data streams. It puts the transport stream to the ASI output after remultiplexing and a precise PCR correction. The temporary storage of the data is made by four 256 Mbit SDRAMs.

10 Setting multicast reception on PCs equipped with more than one network card

On PCs connected simultaneously to more than one network, multicast reception may not always work correctly. The problem may be caused by the fact that the IGMP message which effects the connection to the multicast group is sent out by not the corresponding network card.

Solution is modifying the Windows route table:

Start the Windows command line. Using the „route print" command list the actual route table. In our case the rows starting with „224.0.0.0" show that the messages in the multicast range are registered in two network cards. As these rows cannot be deleted, a new entry needs to be made, which (if using multicast groups in the 239.X.X.X range) should be:

„route add -p 239.0.0.0 mask 255.0.0.0 [IP address of the selected network card]".
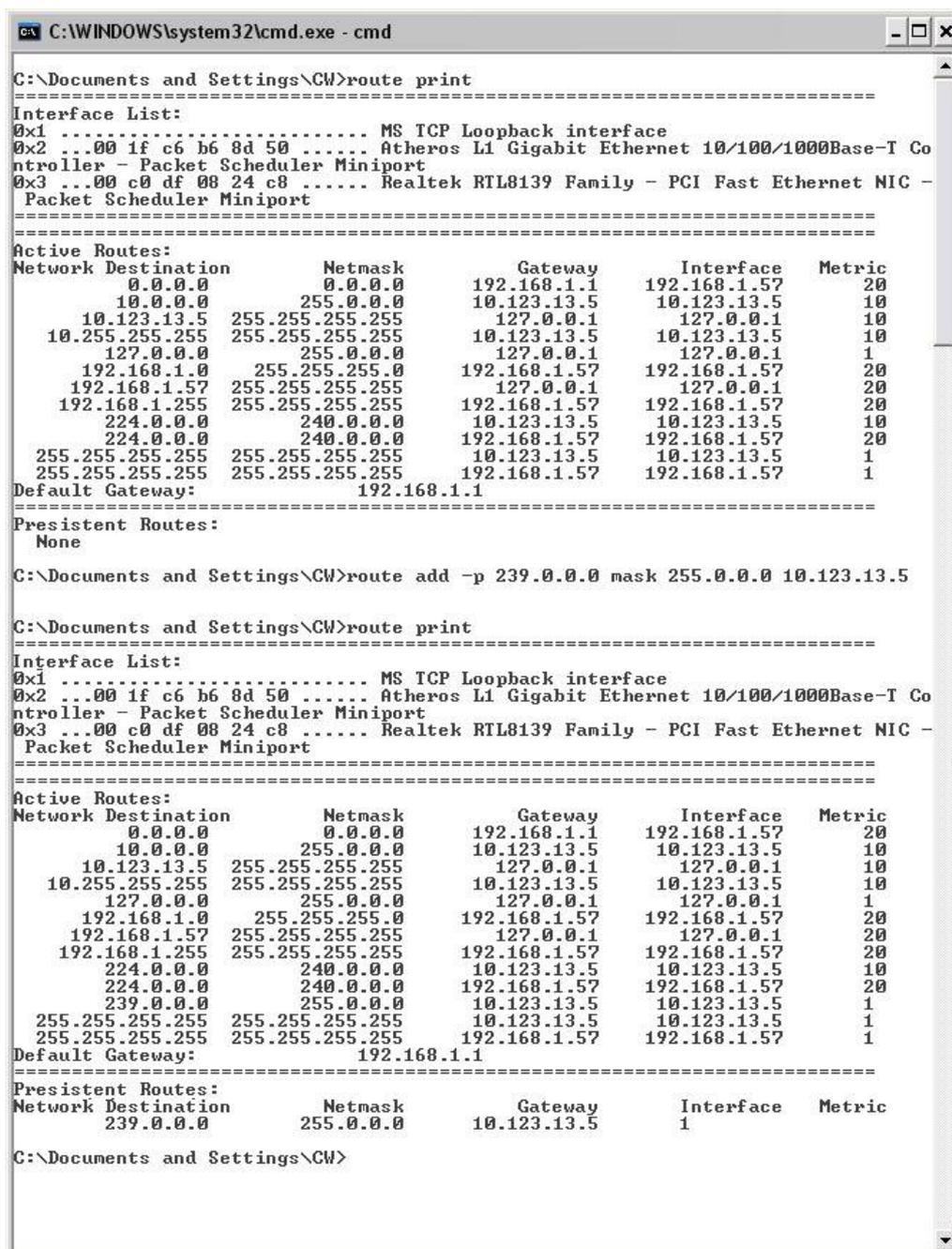
```
C:\WINDOWS\system32\cmd.exe - cmd                                    _ □ ×

C:\Documents and Settings\CW>route print
===========================================================================
Interface List:
0x1 ........................... MS TCP Loopback interface
0x2 ...00 1f c6 b6 8d 50 ...... Atheros L1 Gigabit Ethernet 10/100/1000Base-T Co
ntroller - Packet Scheduler Miniport
0x3 ...00 c0 df 08 24 c8 ...... Realtek RTL8139 Family - PCI Fast Ethernet NIC -
 Packet Scheduler Miniport
===========================================================================
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
        0.0.0.0          0.0.0.0      192.168.1.1     192.168.1.57      20
       10.0.0.0        255.0.0.0     10.123.13.5      10.123.13.5      10
    10.123.13.5  255.255.255.255       127.0.0.1        127.0.0.1      10
 10.255.255.255  255.255.255.255     10.123.13.5      10.123.13.5      10
      127.0.0.0        255.0.0.0       127.0.0.1        127.0.0.1       1
    192.168.1.0    255.255.255.0     192.168.1.57     192.168.1.57      20
   192.168.1.57  255.255.255.255       127.0.0.1        127.0.0.1      20
  192.168.1.255  255.255.255.255     192.168.1.57     192.168.1.57      20
      224.0.0.0        240.0.0.0     10.123.13.5      10.123.13.5      10
      224.0.0.0        240.0.0.0     192.168.1.57     192.168.1.57      20
255.255.255.255  255.255.255.255     10.123.13.5      10.123.13.5       1
255.255.255.255  255.255.255.255     192.168.1.57     192.168.1.57       1
Default Gateway:        192.168.1.1
===========================================================================
Presistent Routes:
  None

C:\Documents and Settings\CW>route add -p 239.0.0.0 mask 255.0.0.0 10.123.13.5


C:\Documents and Settings\CW>route print
===========================================================================
Interface List:
0x1 ........................... MS TCP Loopback interface
0x2 ...00 1f c6 b6 8d 50 ...... Atheros L1 Gigabit Ethernet 10/100/1000Base-T Co
ntroller - Packet Scheduler Miniport
0x3 ...00 c0 df 08 24 c8 ...... Realtek RTL8139 Family - PCI Fast Ethernet NIC -
 Packet Scheduler Miniport
===========================================================================
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
        0.0.0.0          0.0.0.0      192.168.1.1     192.168.1.57      20
       10.0.0.0        255.0.0.0     10.123.13.5      10.123.13.5      10
    10.123.13.5  255.255.255.255       127.0.0.1        127.0.0.1      10
 10.255.255.255  255.255.255.255     10.123.13.5      10.123.13.5      10
      127.0.0.0        255.0.0.0       127.0.0.1        127.0.0.1       1
    192.168.1.0    255.255.255.0     192.168.1.57     192.168.1.57      20
   192.168.1.57  255.255.255.255       127.0.0.1        127.0.0.1      20
  192.168.1.255  255.255.255.255     192.168.1.57     192.168.1.57      20
      224.0.0.0        240.0.0.0     10.123.13.5      10.123.13.5      10
      224.0.0.0        240.0.0.0     192.168.1.57     192.168.1.57      20
      239.0.0.0        255.0.0.0     10.123.13.5      10.123.13.5       1
255.255.255.255  255.255.255.255     10.123.13.5      10.123.13.5       1
255.255.255.255  255.255.255.255     192.168.1.57     192.168.1.57       1
Default Gateway:        192.168.1.1
===========================================================================
Presistent Routes:
Network Destination        Netmask          Gateway       Interface  Metric
      239.0.0.0        255.0.0.0     10.123.13.5      1

C:\Documents and Settings\CW>
```

11 Advantages and drawbacks of the CableWorld devices compared with other manufacturers' products

Advantages and drawbacks of the CableWorld products compared with those of the European competitors can be summarized as follows:

Advantages

CableWorld develops and manufactures complete digital systems and avoids applying in its systems other manufacturer's products. In CableWorld's product line one single device is not own product only, the CW-4268 QAM Modulator-8, which is manufactured in co-operation with the Dutch STN company.

Since all products are own developments, CableWorld's technicians understand them up to the smallest details, they are capable of providing high level technical support in the application. Beside the technical support the company is ready to deliver also customized solutions. The company holds training courses at different levels for system planners and system operators on payment of a fee.

The buyers of the CableWorld products need to pay for the hardware only, the device control software is free of charge, their latest version is available at the company's web site www.cableworld.eu for free download. The web site includes also theoretical and practical guidelines for solving the tasks emerging in the digital television field.
CableWorld makes its products capable of performing also measuring tasks, thus preserving the users from purchasing expensive measuring equipment for operating and troubleshooting the system. Most of the CableWorld products are equipped with an integrated TS analyzer function, which permits inspecting both the input and the output streams during operation. The method worked out for analyzing the TS permits using also other manufactures software. Using the CAM modules is supported by free CAM Analyzer software.

CableWorld implements its products with FPGA circuits, and includes no computer in its products. Thus the power consumption of the products is one or two magnitude less than that of the competing products. The consumption of about 15 W of the devices results in high reliability an long lifetime.

Programming the devices will be made from computer, over IP network, thus the possibility of the remote control of the whole system, and also the control over Internet is an intrinsic feature. The items of the device control software are designed under Windows but the applied IP control permits control also from other environment e.g. from under Linux.

CableWorld is an open company, it publishes the circuit solutions, and even the source codes of the software may be made available. The company provides high level technical support those who undertake establishing their individual system or designing own software.

CableWorld cares of the appearance of its products, the devices are manufactured with design front panels; the system built of CableWorld devices has a unique, homogeneous attractive appearance. The applied 19" modular system assures high flexibility and supports further extension of both small and large systems.

The products are designed not for the momentary market demands and to the day to day fashion, but they are created for use on the long term, serving the needs of the coming years, too. Although these comprehensively designed universal products mean a severe challenge for not well skilled users, they will not need to be replaced for coping even with demands at establishing the next years'

more and more complex and complicated services. Generally, not even a half of the features included in the CableWorld products are utilized yet today.

Today CableWorld's strength is the remultiplexers and the IP transmission devices; these solutions and this product range are outstanding even on a world scale.

CableWorld's broad product range permits building complete systems in both ASI and IP environment without using other manufacturers' products. In order to allow building complete systems from one single source, CableWorld offers also ready made rack cabinets, confectioned connecting cables etc.

Drawbacks

Of course the CableWorld products cannot be regarded impeccable from all aspects; they also have deficiencies and drawbacks.

For scrambling the services CableWorld uses not the DVB Common Scrambling Algorithm, and the products are not equipped with Simulcrypt interface. In spite of CableWorld's own scrambling system, which can very advantageously be used in building small to medium systems, it is not suitable for those using already Simulcrypt.

At designing the devices CableWorld's engineers starts from the theoretical bases and use the effective standards, thus they include in the device numerous features which will be needed in the next years only. This approach may make installation and operating difficult for not properly skilled operator personnel, because they are disturbed by the wide range of facilities and they cannot not cope with a part of them.

Because of the universal design and the modular structure there are devices which need to be programmed using multiple items of control software (e.g. one of them programs the tuner, and programming the CAM needs running another software) which will be considered disturbing by some users.

CableWorld's products are designed to be suitable for use with other manufacturers' products. This universal layout (e.g. loop-through ASI inputs, doubled ASI outputs etc.) may unnecessary raise the price of the product in some systems.

CableWorld does not apply a computer in its products, therefore their user interface is not the popular web interface. The user interfaces designed in Windows environment are not really favoured by users of Linux and similar environments. CableWorld is working on the web user interfaces, but they will be brought out in the next years only.

For those building OFDM systems, a drawback is that CableWorld's product range does not include OFDM modulators, and bringing out this kind of product is not even planned in the next years.

CableWorld provides much support for establishing IPTV services, but it offers no middleware for them. Designing the system operating software (e.g. pay TV billing system) is given over to the user.
CableWorld's products can be used with the set-top box models of most manufacturers, but CableWorld may be criticized for not offering delivery of set-top boxes for either IPTV or DVB-C systems.

A deficiency of CableWorld's IPTV system not to have scrambling for building pay TV systems, the product range does not permit establishing scrambled IPTV systems.

CableWorld has in its product range no statistical remultiplexers, data rate reducing modules and MPEG-2, MPG-4, SD and HD transcoders either. Developing SDI inputs and outputs is only in the phase of being developed yet.