

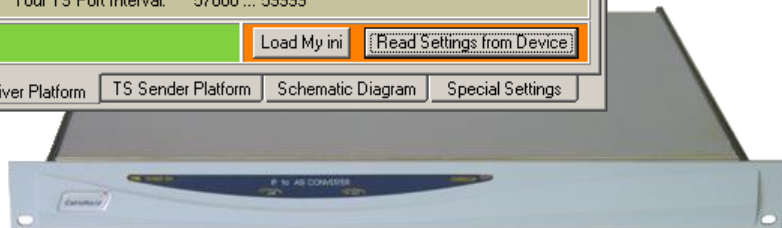
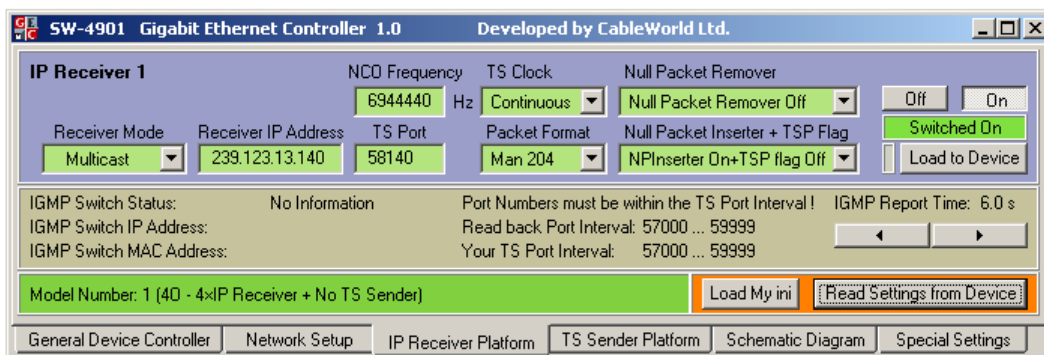
CW-4942 IP to ASI Converter

**IP receiver with ASI output and PCR corrector
for the reception of unicast and multicast data streams**

In the field of digital television transmitting the transport stream over IP network will be more and more demanded. Since IP networks transmit the data in asynchronous way, the output signal at the receiving side is not smooth. This ragged data stream is suitable for those devices equipped with data storage (MPEG-2 decoder, TS remultiplexer etc.). In contrast with this, modulators need continuous and smooth input signal, therefore their feeding requires receivers, which in lack of actual incoming IP data are capable of making the signal smooth by adding null packets. Adding and removing null packets changes the data stream therefore after such operation PCR correction becomes necessary.

The CW-4942 IP to ASI Converter is suitable for receiving both unicast and multicast data streams alike; for the IP reception it uses 'IP Receiver 1' of the CW-4901 Gigabit Ethernet Controller. Handling multicast messages is made at IGMP v.2 level: the device calls in the data stream with IGMP Membership Report, it answers IGMP Queries and at the end of reception it logs off the multicast group. The Gigabit Ethernet Controller can be configured very widely: the CW-4942 provides numerous operation modes at both the IP and the ASI side. When the mode can be chosen freely, use the transparent transmission mode. When continuous output data stream is required, the device generates null packets with the frequency of the internal NCO, and the packets actually arriving from the IP network will be encapsulated in these packets. Restoration of the PCR in the output data stream is performed by a 64-member PCR corrector.

Beyond the Gigabit Ethernet Controller the CW-4942 IP to ASI Converter comprises the ASI interface and the PCR corrector only. Configuring the input and output parameters is made with the 'IP Receiver 1' module of the SW-4901 Gigabit Ethernet Controller software, which is available at www.cableworld.eu for free download and use. The PCR corrector can be switched on and off with the PCR corrector switch in the SW-4841 software.



- Unicast and multicast operation mode with wide configuration facilities
- Multicast network handling at level-2
- Continuous, burst format and transparent transmission, PCR corrector
- IPv4 protocol, prepared for IPv6, free programmable IP address
- SNMP remote control facility

In CableWorld's newly developed system the transport streams travel from one device to the other over IP network, instead of using ASI cables. The new system is referred to as

Digital Television System

with **Transport Stream Transmission over IP.**

All devices of the new system are equipped with gigabit Ethernet connection. Other manufacturers' devices equipped with ASI output or input can be connected to the system through the CW-4941 or the CW-4942 and CW-4944 converter respectively. All these devices can also be used alone to convert the transport stream in IP environment or retrieving it from IP respectively.

The CW-4942 IP to ASI Converter is the upgraded version of the CW-4842 IP to ASI Converter. As the outcome of this upgrade, the CW-4942 IP to ASI Converter

- is capable of communicating with multicast networks by handling the IGMP messages,
- both the input and the output side has been expanded with new features; e.g. the device can be configured to both transparent and continuous output signal,
- it is equipped with an improved 64-member PCR corrector with a narrower tolerance range.

The CW-4942 IP to ASI Converter is equipped with a double ASI output stage; these two outputs can be used for feeding two ASI lines independently. This design permits feeding e.g. modulators or decoders and simultaneously also the monitoring instruments directly from the device without the need of an ASI distributor.

In unicast mode the IP to ASI Converter sends an answer to the messages searching for it (ARP), and waits for the UDP/IP data packets arriving at its IP address. When receiving a UDP packet, it unpacks the data of the transport stream and puts them on the ASI line. For assembling the ASI output signal, NCO, null packet inserter, PCR corrector and some further auxiliary circuitries are at the user's disposal.

In multicast mode, on getting an instruction to receive a data stream, it calls the data stream with an IGMP message, and puts it on the ASI line in the mode pre-programmed by the user. During operation the device regularly signals the switch the further need for data, and on switching off the IP receiver it automatically logs off the used multicast group.

The IP to ASI Converter, as a receiver has to silently wait for the input data. However, most switches within some minutes erase from their MAC tables those devices making no traffic. In order to prevent those troubles coming from the erasure of the MAC address, the CW-4942 is capable of regularly advertising its presence to the network thus preventing erasure of its MAC address from the MAC table. This advertising function can be switched on and off, the repetition time of the messages is free programmable.

The detailed description and instruction set of the Gigabit Ethernet Controller used in the CW-4942 IP to ASI Converter is published in the data sheet (4901p-a.pdf) and user's guide (4901k-a.pdf) of the CW-4901 Gigabit Ethernet Controller.

The transmission of the transport stream over IP network and the extensive use of the multicast mode are technical novelties, which should be get acquainted with by the operators of digital television systems very shortly.

The novelty of CableWorld's solution is in using the same network for controlling the devices and transmitting the TS, thus the user needs to establish one single network only. Separation of these two functions will be made with the Port Numbers: for the TS transmission a dedicated Port Number range has to be programmed into the device, which then must not be used for device control.

Configuring the networks and survey of the suitability of switches etc. are not simple tasks. CableWorld provides its partners high-level support in solving these problems. The basics on how to transmit the transport stream over the IP network is given in CableWorld's „Transport Stream Managing Over IP" file.

Technical data

IP Input

Physical layer	1000Base-T / 100Base-T (Auto Negotiation)
Operation mode	full duplex
Protocol	IPv4 (prepared for IPv6)
Modes	unicast, multicast
Number of connectors	1 (TS input and device control)
Type of connector	RJ-45
UDP/IP packet	1 ... 7 TS packets/UDP (extensively programmable)

ASI Output

ASI	according to TM 1449 Rec. 1
Output voltage	880 mV _(p-p)
Impedance	75 Ω
Number of outputs	2 (double output)
Connector type	BNC socket (insulated)
Max. data rate	200 Mbit/s

Device control

Physical layer	the same network as used for transmitting the TS
Selection of the messages	upon the Port Number (the Port of the device control must not fall into the Port number range of the transport streams)

General data

Front panel LED displays	LINK, ACT, OVERFLOW
Mass	approx. 3.5 kg
Physical dimensions	19" × 1 HU
Width × height × depth	483 × 43.6 × 473 mm
Service period	continuous
Power requirement	90 ... 264 V, 47 ... 440 Hz
Power consumption	max. 20 VA
Operating temperature range	+ 5 ... +40 °C
Relative humidity	max. 80 %
Storage temperature range	- 25 ... +45 °C
Relative humidity	max. 95 %, non-condensing


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