CW-4000
PROFESSIONAL DIGITAL TELEVISION DEVICES

CW-4861 **TOTALCRYPT PAY TV SCRAMBLER**
TCM-061 **TOTALCRYPT DESCRAMBLER MODULE**
components of the TotalCrypt system

USER'S GUIDE

Dear User!

Digital television technology permits implementing numerous features, which could not or hardly could be achieved in analogue technology. Among them the most demanded is the scrambling of programs for controlling the access to them.

The CW-4861 TotalCrypt Pay TV Scrambler encrypts (scrambles) the data of the ASI signal connected to its input, so that they can only be restored (descrambled) with a special device, the TCM-061 TotalCrypt Descrambler Module. The Descrambler Module is connected to the system through the CI (Common Interface) of the subscriber's set-top box. The whole scrambling system is referred as TotalCrypt Scrambling System.

The common interest of both the user and the manufacturer is to assure that no one except for the involved persons can obtain information about the way of scrambling. Therefore the detailed description of the system and other documents as well as the programming software will be delivered in a registered, personal, non-transferable copy after having signed the Non-disclosure Agreement.

1. MECHANICAL CONSTRUCTION

The CW-4861 Pay TV Scrambler is built in standard 19" × 1 HU instrument frame. It is delivered along with following accessories:

1. Power cord   1 ea.
2. Spare fuse T 1.25 A
   (placed in the fuse holder mounting)   1 ea.
3. Crossover cable with RJ45 connectors   1 ea.
4. User Manual and software delivered to the user in 1 copy after having signed the Non-disclosure Agreement and bought the device.

The power consumption of the device is very low therefore no cooling or ventilation is needed, however do not use it covered, blocking the natural airflow.

2. ELECTRICAL CONSTRUCTION

The CW-4861 Pay TV Scrambler receives and scrambles the ASI signals connected to its input. The data rate of the output signal is identical with that of the input signal. The output signal can directly be connected to QAM modulators and other transmission devices. The CW-4861 has loop-through ASI input and double ASI output.

The device is equipped with an own switching mode power supply. The supply voltage of the interface circuitries is 3.3 V; the signal processing circuitries are supplied with a voltage as low as +1.2 V. The power consumption of the device is low; it is suitable for continuous service.

The device can be programmed through CableWorld's CW-Net system; the steps of putting in operation the system is described in the Using_CW_Net.pdf file at www.cableworld.hu.

All items of CableWorld software are available for free download and use at www.cableworld.hu. The software user manuals are available there separately in pdf format, too. The CW-4861 Pay TV Scrambler can work together with all CableWorld software, thus e.g. its input and output transport stream can be analyzed with the SW-4811(B) software, the IP address of the device can be set with the SW-4800 software etc. The software for configuring the device and for setting the scrambling mode is delivered on a CD along with the User Manual after signing the Non-disclosure Agreement.

All CableWorld devices are shipped with IP address set to 10.123.13.101. When using them in network, the IP address must be changed to avoid conflict between the IP addresses of multiple devices.

For changing the IP address download, install and use the SW-4800 software. All knowledge necessary for this are included in the Help file of the software.

3. SYSTEM BUILDING

The CW-4861 Pay TV Scrambler has to be connected in front of the QAM modulator or similar transmission device, inserted in the ASI data stream. Figure 1 shows an arrangement where a remultiplexer delivers the TS, which then goes through the Pay TV Scrambler to the QAM modulator.
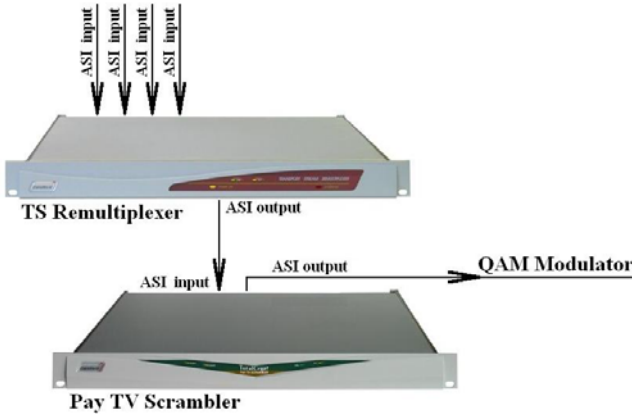

Figure 1
Inserting the Pay TV Scrambler in the system

If the set-top box or digital TV set in the receiving side recognises the given program being scrambled, it searches the CA descriptor in the PMT table, and transmits the stream to the CAM module, whose identifier is identical with the identifier found in the CA descriptor. In order that the set-top box transmits the TotalCrypt scrambled programs to the TCM-061 Descrambler module, in the scrambled channel the CA descriptor (09_04_FF_F8_FF_F8_) of the TotalCrypt system must be included. The CA descriptor can be placed in the stream in one step in the course of remultiplexing. The way of placing the CA descriptor of the TotalCrypt system is discussed in the "Remultiplexing the transport stream for use with the TotalCrypt system" description in the TCMRem.pdf file at www.cableworld.hu.

Even if the transport stream is not directly compiled by the user of the scrambler, placing the CA descriptors has to be performed by them. In this case the PMT tables of the transport stream need to be replaced.
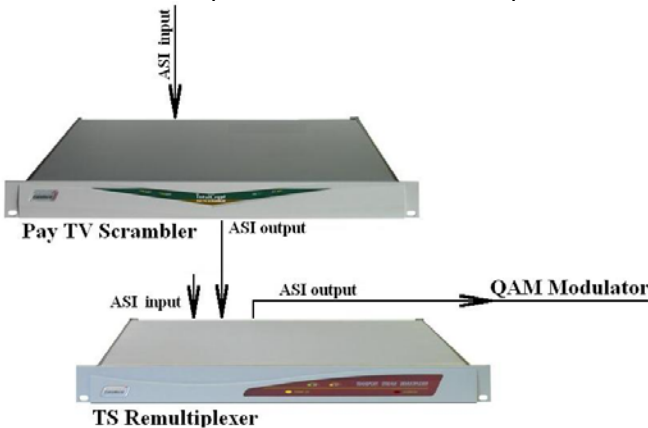

Figure 2
Replacing the PMT tables after scrambling

Replacing the PMT tables can be performed even with the smallest, two-input Transport Stream Remultiplexer, the CW-4852. Figure 2 shows an arrangement where replacing the tables will be done after scrambling.

In the procedure of preparing the scrambled transport stream the remultiplexer and the Pay TV Scrambler can be cascaded in both order. If anywhere PCR correction is needed in the scrambled signal, scrambling of the PCR has to be switched off.

For putting in operation the Pay TV Scrambler, the structure of the transport stream to be scrambled has to be known in details. Note, using the SW-4811(B) Transport Stream Analyzer software the input and output signal of the Pay TV Scrambler can directly be analyzed using the built-in TS analyzer function of the CW-4861.

4. TECHNICAL DATA

CW-4861 TotalCrypt Pay TV Scrambler

Input and output signal	asynchronous serial (ASI) (according to DVB-TM1449 Rec. 1)
ASI input	loop-through type
Input data rate	max. 56 Mbit/s
Minimum input voltage	140 mVp-p
Input impedance	75 Ω (BNC)
ASI output	double type (2 identical outputs)
Output data rate	identical with that of the input signal
Output level	typ. 800 mVp-p
Output impedance	75 Ω (BNC)
Scrambling system	DVB compatible unique procedure by CableWorld
Front panel LED display	LINK, ACT, EMM1, EMM2
Programming	according to the User Manual

General data

Mass	approx. 3 kg
Physical dimensions	19" × 1 HU
W × H × D	483 × 43.6 × 473 mm
Power requirement	90 ~ 264 V, 47 ~ 440 Hz
Power consumption	max. 30 W
Service period	continuous
Operational temperature range	+5 … +40 ºC
Relative humidity	max. 80 %
Storage temperature range	-25 …+45 ºC
Relative humidity	max. 95 %, non condensing

TCM-061 TotalCrypt Descrambler Module

Compatibility	according to EN 50221
Module type	16 bit II. type PC card
Physical dimensions	54 × 5 × 85 mm
Supply voltage	+5 V
Current consumption	max. 100 mA