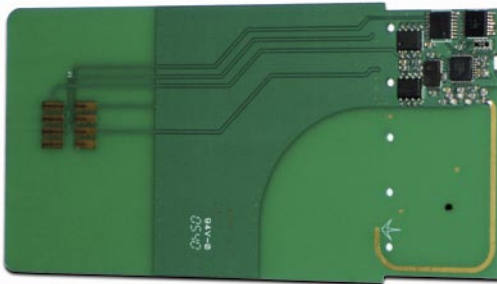


Wireless SmartWi

Pay TV reception all over the house

Picture this: you have one pay TV subscription but several TV sets spread all across the house. In the past there were three ways to distribute pay TV to more than one TV: you either had to lay a dedicated cable to each TV set and this way set up your own private cable network, or you had to use small radio transmitters which distribute the channel to all rooms, or you simply added any number of subscriptions to make sure everybody in your family can watch the pay channel they want. However, options 1 and 2 mean that the same channel has to be watched by everyone in the house, and option 3 is only available for those willing to spend money on several subscriptions month by month.



The old SmartWi card had an antenna which partially radiated into the receiver and thus could cause interference with some receiver models.

Danish company SmartWi has looked at this dilemma and has come up with a simple yet ingenious solution to this problem. The pay TV smartcard is inserted into an external card reader which at the same time is a radio transmitter. Special cards with a reception antenna are then inserted into the slots of all receivers in the house. If somebody selects an encrypted pay TV channel on their individual receiver the required key is requested by the receiver from the original smartcard in the external reader. The reader then transmits the valid key back to the reception card in the receiver and the requested channel is shown on the TV. Sounds complicated? Maybe, but it works perfectly in a matter of milliseconds.

This system does not only work with one or two cards, but with

a total of seven different reception cards, four of which can be active at the same time. Compliance with the ISO 7816 standard is guaranteed and the manufacturer says an indoor distribution range of at least 15 m can be achieved. There is no indication regarding outdoor range, but we assume 150 m or even more should be possible.

TELE-satellite presented this clever solution some time ago, but SmartWi has not rested on its laurels in the meantime and has been working to further improve the system. Even back then both the manufacturer and TELE-satellite received overwhelmingly positive feedback from our readers, and the new version 8 offers an improved transmitter/reception unit on the cards, a PCB antenna and an additional protection of the sensitive electronics

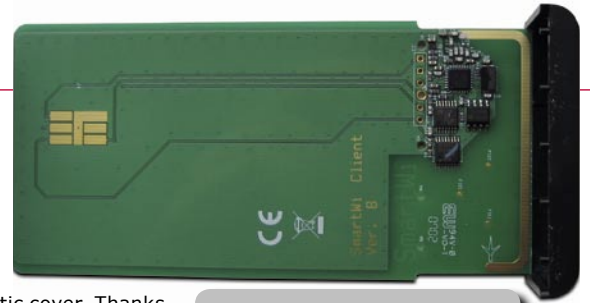
with a black plastic cover. Thanks to the new antenna, interference is now almost a thing of the past because no more radiation can enter the receiver.

The outward appearance of the control unit has remained unchanged. On the inside, however, a lot has been amended. Firstly, the unit is now USB 2.0 compatible, and secondly, the transmission and reception capabilities have been vastly improved. Like for the previous model the power supply comes from the PC's USB interface, yet an additional external power pack is also included.

In direct comparison, the new and improved model features very sturdy reception cards which have lost their delicate touch that gave rise to some concern in the first version, and the overall workmanship gives a very positive impression. The manufacturer offers a whole range of software on its website at www.smartwi.net, ranging from a firmware update for the control unit or the appropriate PC applications to the download of the instruction manual. There is even a dedicated support forum for users and a support technician of SmartWi is available for expert advice.

Everyday use

Before the SmartWi box is ready to use it has to be equipped with the necessary firmware. On its website the manufacturer offers two different types which support the Irdeto, Viaccess, Conax, Cryptoworks, Nagravision and Seca Mediaguard encryption systems. The control unit is the size of a pack of cigarettes and features the USB interface for establishing a connection with the PC, as well as the plug for the external power pack, a status LED and of course the core of the system, the card reader. The



A close-up with the cover removed shows the antenna: the U-shaped conductor on the right side which uses the whole length of the card in the new version 8

SmartWi box can be installed and configured in the usual Plug&Play way, which makes it rather easy to install the required driver and to open the programming tool.

The software update only takes some seconds and the next step is the personalisation of the individual reception cards, which is one of the most crucial steps in the process because otherwise everybody within the range of the control unit would have access to pay TV channels – at least in theory, assuming all those unauthorised users have the same technical equipment. SmartWi without personalised cards is much the same as an unprotected WLAN network. To personalise the system, each card is briefly inserted so that both ends can exchange a unique identification code. The other benefit of this process is that two different SmartWi systems do not interfere with each other.

In case the encryption system and/or the individual receivers require the correct ATR code to be available directly on the card, this code can be read out from the original card by the control unit and then transmitted to all active reception cards. In order to set this up the original card has to be briefly inserted into the control unit, followed by all reception cards. The box takes care of the rest. For our practical test we used the smartcard of a German pay TV provider in connection with an Alphacrypt CI, a Cryptoworks card of Austrian public broadcaster ORF and a Viaccess erotics smartcard with



The power pack, the control unit and three SmartWi cards (only one shown) are included in the package

a Viaccess CI.. The control unit detected all three original cards flawlessly and within moments all available pay TV channels could be individually selected and watched on all receivers within the SmartWi system, all this with only one smartcard for each pay TV provider.

In our test setup, all receivers were located in the same room, which is a rather unrealistic scenario in the real world. So we went out and set up the whole system in the house of one of our editorial staff. We tested the SmartWi system in different spots in the house from the basement hobby room to the children's room in the loft and were impressed with the results. Thanks to the control unit which was placed in the living room we were able to supply pay TV all over the house. The 15 m range given by the manufacturer is a safe estimate on the lower side of the maximum distance between control unit and reception cards, and even reinforced concrete walls could not stop the radio waves.

According to the manufacturer up to four reception cards can be used simultaneously. While we cannot confirm this claim as only three cards came with our test unit, we can nonetheless testify that these three cards work perfectly when used at the same time. Our test also confirmed that the system is compatible with all

current CI modules. While internal card readers are also supported in general, there is slightly less perfection with these when compared to CI modules.

The SmartWi website offers a small tool for ambitious users and experts, which shows information regarding the currently used pay TV smartcard and the complete transmission/reception system. This way possible problems can be detected and solved at an early stage. In addition there is another free application available which can be used to perform a timing test. Generally, the internal card reader of a receiver or the CI module needs to access the smartcard every ten seconds in order to be able to present a selected pay TV channel error-free. Calculating the keys in the CI module according to the information received via satellite may take up to two seconds. If several reception cards are in use at the same time it becomes obvious that the system may sooner or later reach its limits. This is all the more risky if a digital receiver requests the keys every four seconds, for example, instead of the usual ten seconds. The timing tool is used to exactly measure these request times and depending on the receivers' requirements, it can be established whether indeed up to four reception cards can be used simultaneously or whether two cards are the maximum. If you still use the maximum number of cards in such a scenario, all four receivers may show decoding errors.

TECHNIC DATA	
Manufacturer	SmartWi, Denmark
Fax	+45 86406622
E-mail	http://www.smartwi.net/contactus.html
Model	Wireless SmartWi, version 8
Function	Card splitter with wireless radio transmission
Radio frequency	ISO 7816 Standard
Range	Inside >15m, outside n.a.
Maximum number of reception cards	7 (4 of which active)
Simultaneously available channels	4
Power supply	Master max. 100mA, clients max. 50mA
Firmware upgrade possible	yes
Dimension	90x57x23mm

Expert conclusion



The radio connection between the card reader and the reception cards works flawlessly even over larger distances. This means that a connection between the control unit and several receives can easily be established in single-family house. Thanks to the personalisation of each card unauthorised access from outside is efficiently blocked. The workmanship of both the card reader and the reception cards is very good.



Thomas Haring
TELE-satellite
Test Center
Austria

Some receivers with an integrated card reader sometimes experience problems with the reception cards. A software update should easily be able to solve this problem, however.