Installation Sheet
- TDC

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1. OS/T TDC: Introduction

TDC PCB
The TDC PCB is will be used to detect, deactivate and count 8.32MHz labels and tags. When detecting a label the TDC will try to blow it. After a successful blow up, the deactivation will be counted.
Is it not possible to deactivate the label, it will be counted as a FTD (Failure To Deactivate)

The TDC distinguishes between hard- and paper tags
Selectable and distinguishable audio alert for:
- Hard tag detected
- Paper tag detected
- Paper tag deactivated
- Paper tag not deactivatable

The TDC bursts only when paper tags are within detection range (generating minimum electro smog)

The channels
The TDC has two independent channels. To each of these channels can be connected an:
- Add-On antenna
- TDC-DUC.

Stand alone - Master - Slave
There are three possible configurations for the TDC
- Stand alone
- Master
- Slave

Count function
The TDC has the possibilities of:
- Counting deactivations
- Counting detections
- Counting “Failure To Deactivate” (FTD’s)
- Collecting label data (Q-factor).

All this data can be viewed in EASi/Net or in the OS/T Builder.

Upgrading the TDC
It is possible to upgrade TDC. This is done with so called Functionality Modules. The module contains several settings which enable some functions of the TDC. Upgrading the TDC is possible with a combination of the EASi/Net and a handheldterminal and in the future also by using the OS/T Builder.

Firmware
To communicate with a TDC, firmware version 1.602 or higher must be installed.

2. How the TDC works

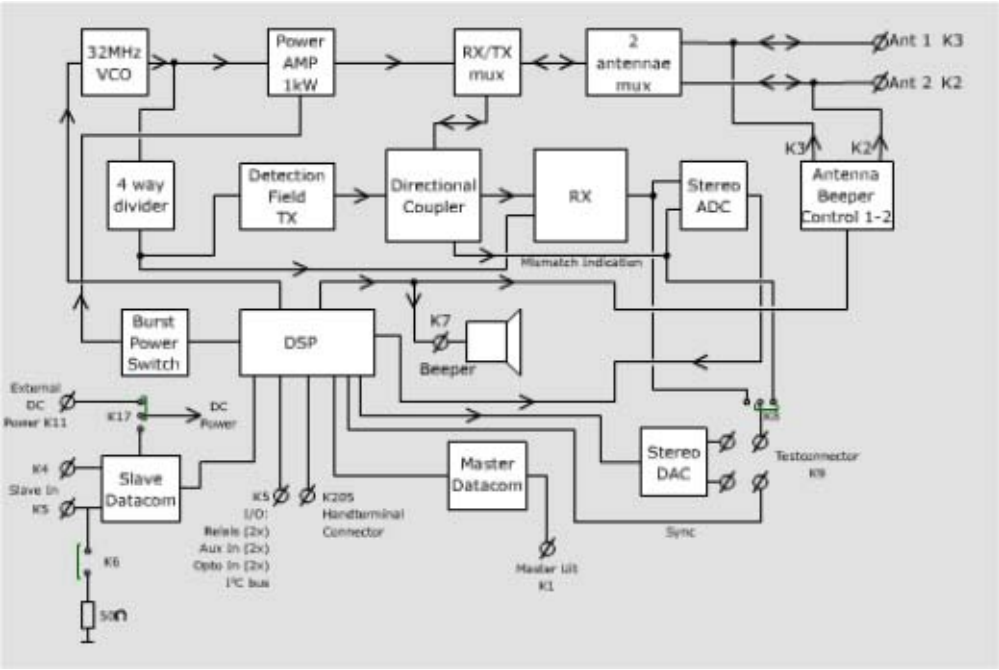
Generally the TDC is in great lines the same as the earlier Nedap deactivators like the DRF2B.
The antenna gets a weak detection-field with a frequency sweep of 7.8 to 8.6 MHz. With a receiver it is possible to detect EAS labels. If the receiver detects a label which matches the adjusted criteria, the deactivator switches a burst power output which generates a very strong RF burst signal exactly at the resonance frequency of the detected label.
One or several short bursts (circa 30uS) of high power (up to 1KW) will deactivate the label.

After the burst, the receiver checks if the label is successfully deactivated.
This behavior is different then the previous Nedap deactivators. The previous types kept on bursting until the label was no longer detected. The TDC doesn't do this. At a successful deactivation a counter will be raised which counts the total amount of successful deactivations. If deactivation fails, an other counter will be raised which counts the failed deactivations. Only when the label is taken out of the detection field and will be placed back in this field a second attempt will take place. The countermeasures can be read by the OS/T network.

The TDC has also some extra functions:
- External In- and outputs
- Data-communication via RS232 and OS/T network
- Possibility to work as a master in an OS/T system

These functions are optional. They can be installed in a TDC as an Functionality Module using the CRA protocol.

Block scheme



The hart of the TDC is the DSP which controls the TDC. In the DSP the signals TD, T1 and T2 are generated who control the 32MHz VCO. The 32MHz VCO creates the OS/T sweep signal.
After being split in four, the detection field transmit signal is generated. This signal will be amplified and via the directional coupler supplied to the RX/TX mux.

As long as that there are no bursts generated the RX/TX mux sends the signal to the antenna mux. This mux will choose the correct antenna or when both channels are used the signal will be switched at each sweep (multiplexing) like other OS/T units.

The received label signal goes the other way around through the both mux's and ends at the directional coupler. The TX signal will send to the receiver-mixer. The directional coupler will take care of the fact that there will be as less as possible transmitter-signal directly into the receiver input.

After filtering, mixing and amplifying the signal comes at the AD converter. The signal will now be processed in the DSP.
When the DSP recognizes a label, a burst will be fired. To do this, the wanted burst-power (100, 400 or 1000 watt) must be switched at the beginning of the sweep period. Also the RX/TX mux must be changed to connect the burst-power output with the antenna mux. The DSP selects the correct antenna, the same as where the label was detected.
At this moment will be waited until the present frequency of the sweep meets the resonance frequency of the detected label. At that moment the final burst-pulse will be generated which switches the burst power output. The burst length is adjustable between 5 and 60uS via the TDC menu (OS/T Builder or Handheldterminal). Also an adjustable amount (0,1 or 2) of repeating bursts can be set for a reliable deactivation.
De deactivator also measures the Q of the label and stores this data. Via the OS/T network, statistic data is available about the quality of the labels.

An on-board buzzer will generate an acoustic signal. By using the handheld terminal or OS/T Builder it is possible to program how and when the signal will take place.

It is also possible to use an acoustic signal at the antennae. To do so a voltage will be put on the coax cable to the antenna. This signal is also adjustable in the handheld terminal or OS/T Builder.

Like other OS/T products it is possible to connect external in- and outputs like for example a keyswitch, I²C I/O board or a counting detacher.

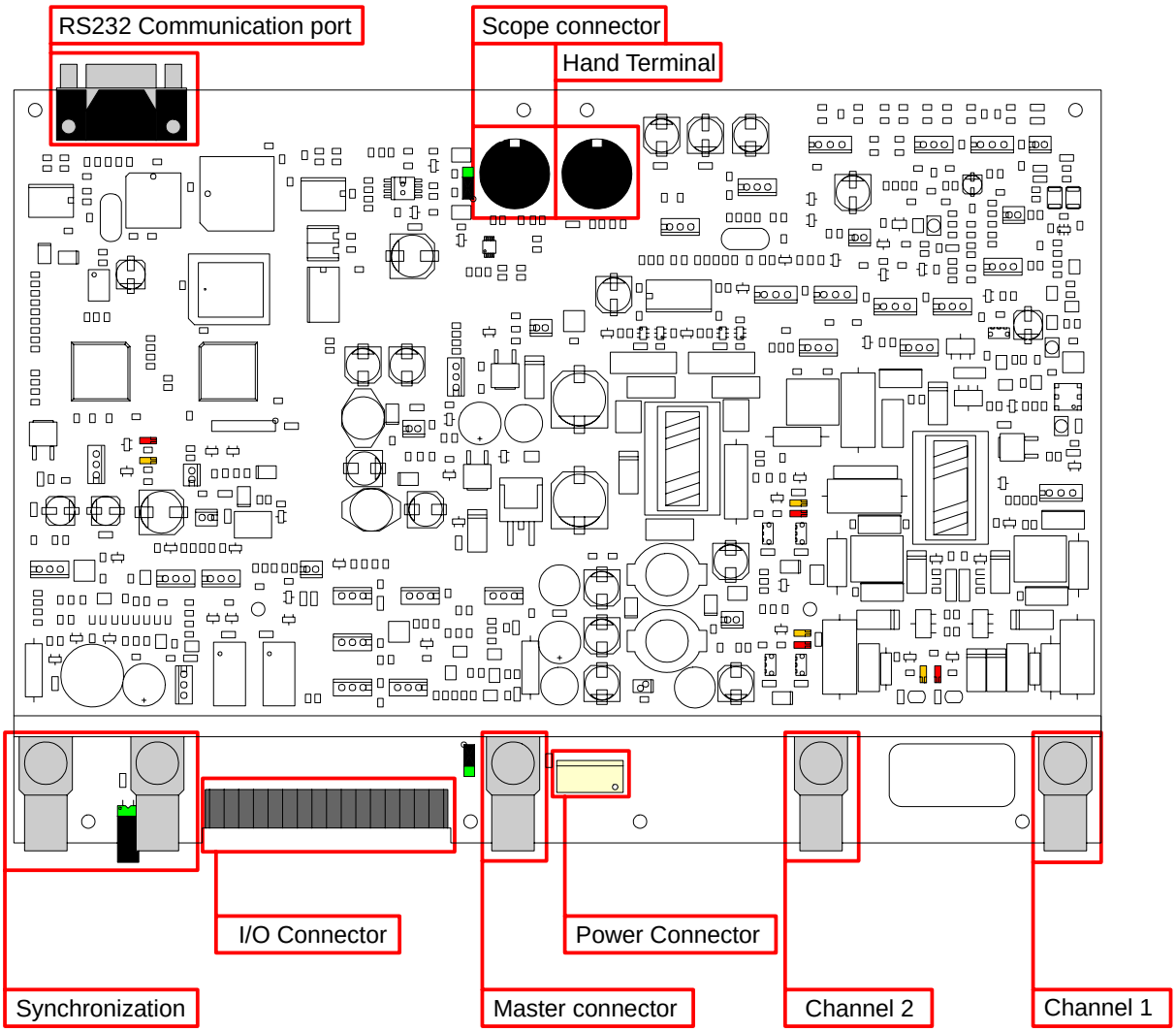
Datacom
The TDC datacom knows 3 configurations, Stand-alone, Slave and Master.

Stand-Alone (Menu datacom=0)
In the stand-alone configuration is no network communication possible. Only by using the RS232 communication is possible.
Synchronization with other units is not possible. This situation will be used for a stand-alone deactivator at a great distance (>10meters) from an EAS system or other deactivators.

Slave (Menu datacom=1)
In the slave configuration the TDC will behave as a normal OS/T slave. Via the slave-sync input the TDC can be put into a network. The network will take care of the datacommunication and synchronization. The 33Volt Dc power can be obtained via this input. In the slave mode the internal sweep-generator has an interleave of 5 to the supplied sync. signal.
The use of the master-output is not possible in slave-mode. When there will be no sync/datacom supplied, the slave will automatically behave as a Stand-alone unit.

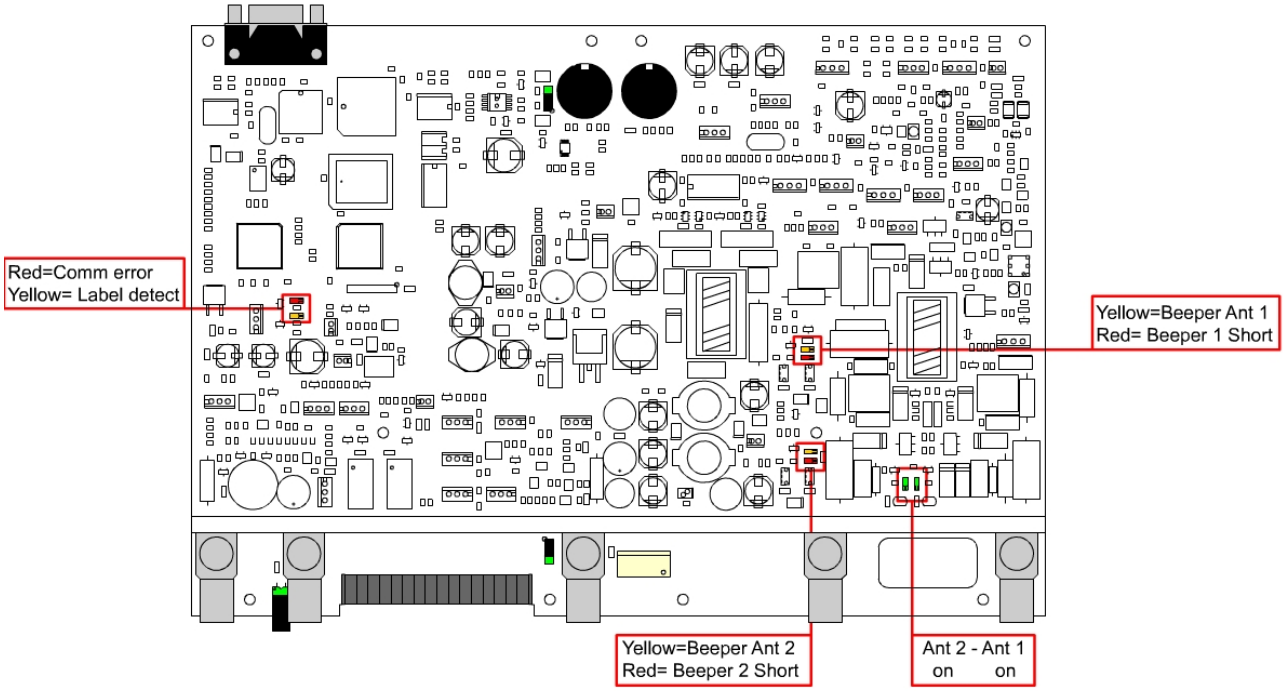
Master (Menu datacom=2)
In the Master mode the TDC behaves as a NCC. The internal sweep generator has an interleave of 1 to the supplied sync. To the master-output several slave units can be connected, like an IQE-unit.

2.1 The Connectors



Connector	Application
RS232	Communication with modem / Remote Service
Scope Connector	For connecting a scope
Handterminal	Connector for the hand terminal, for programming the TDC with a handterminal
Synchronization	To synchronize the TDC with other OS/T equipment
I/O Connector	To set Input and / or output events
Master connector	Outgoing master signal to connect to other (slave) OS/T equipment
Power Connector	For connecting the power supply
Channel 1 & 2	Connectors to connect the antennae to

2.2 The LED's



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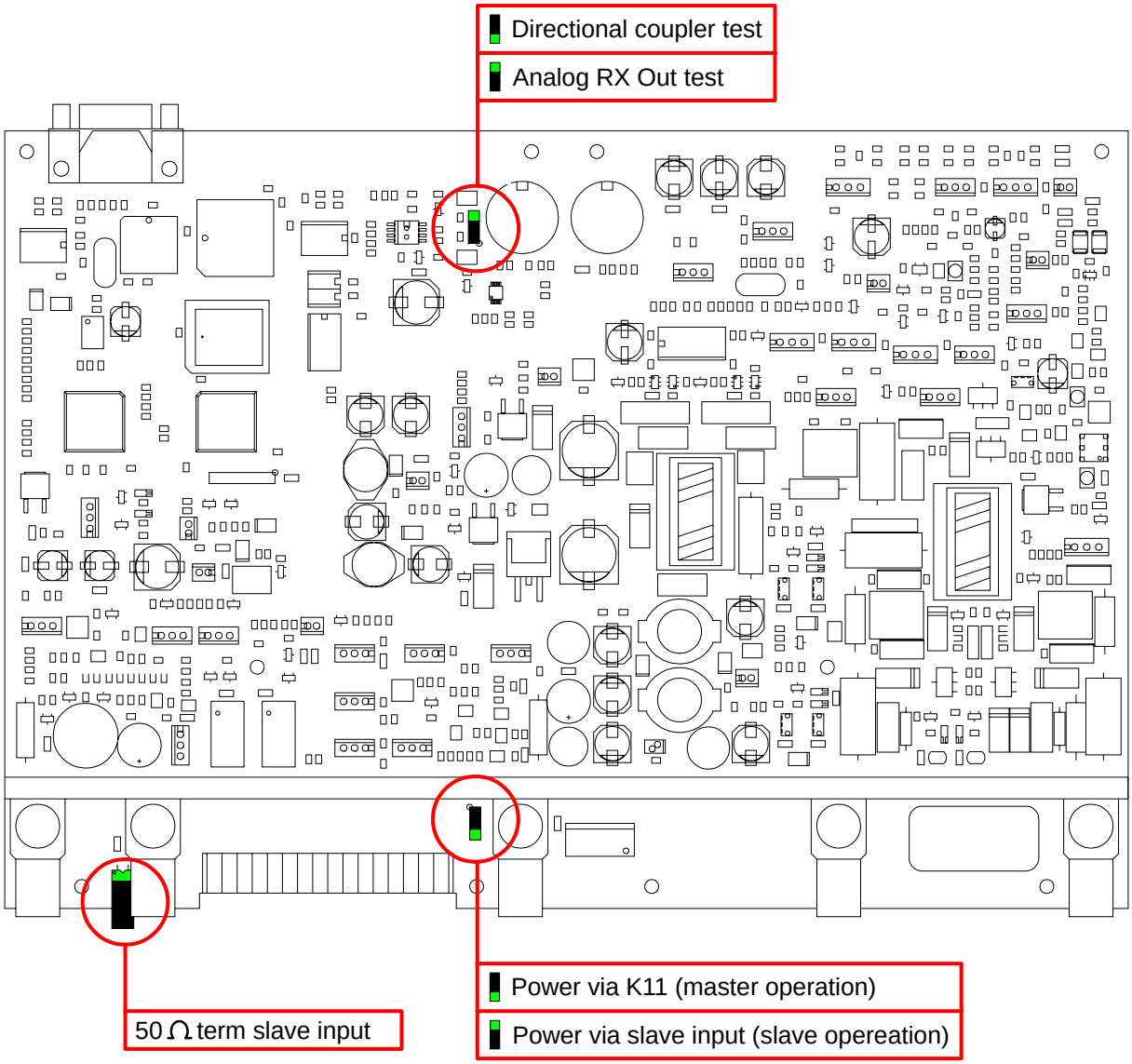
2.3 The Jumpers



Jumper	Apllication
K17	Master / slave setting for power connector K11
K6	50 Ohms term. Slave input
K8	For directional coupler test or analog RX Out test

3. Functionality Modules and CRA upgrade

The TDC is fitted with functionality modules.
The functionality modules make it possible for the customer to buy only the option needed to get system to work.

The hardware is suitable for all functions integrated on the board:
- Standard the board will have basic functions
- These standard function will be programmed as factory defaults
- Features (functionality modules) can be added to the board
- Functionality modules are a combination of different functions

3.1 TDC Board functions

Data Communication
The data function of the board
- 0 = standalone
- 1 = slave
- 2 = master

Relays Function
Enables the use of the relay
- 0 = relay disabled
- 1 = 1 relay enabled
- 2 = 2 relay enabled

Input function
Enables the use of the inputs
- 0 = inputs disabled
- 1 = input 1 (opto) enabled
- 2 = input 2 (opto) enabled
- 3 = input 3 (TTL) enabled
- 4 = input 4 (TTL) enabled

I²C function
Enables the quantity of external I²C units (relay and input boards)
- 0 = I²C connection disabled
- 1 = 1 I²C board
- 2 = 2 I²C boards
- 3 = 3 I²C boards
- 4 = 4 I²C boards

Slave function
The maximum of slave units that can be connected to a master unit
- 0 = no slave connection possible
- 1 = maximal 1 slave unit
- 2 = maximal 2 slave unit
- 3 = maximal 3 slave unit
- 4 = maximal 4 slave unit
- 5 = maximal 5 slave unit
- 6 = maximal 6 slave unit
- 7 = maximal 7 slave unit
- 8 = maximal 8 slave unit

Modem function
The function of the connected modem

- 0 = modem function disabled
- 1 = call in
- 2 = call out
- 3 = call in and out

Bridging function
Enables the communication of a master unit

- 0 = no communication possible
- 1 = downward communication
- 2 = upward communication
- 3 = down and up ward communication

Detection function
Enables the detection on the TDC channels

- 0 = channels disabled
- 1 = channel 1 detection
- 2 = channel 1+2 detection

Deactivation function
Enables the deactivation on the TDC channels

- 0 = channels disabled
- 1 = channel 1 deactivation
- 2 = channel 1+2 deactivation

TDC Data Collect function
Functionality module enables the data collect function and the use off EASi/Net

- The function is not traceable in the unit
- The validity of the DCM function can be checked in the EASi/Net data base

3.3 Functionality Modules update

Standard it is possible to upgrade some Functionality Modules (FM).
This can be done by logging in to the EASi/Net and obtain a special series of numbers which must be filled in into the board by the handheld terminal.

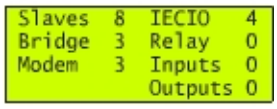
3.4 Upgrading the TDC

First check the FM in the units with the handheld terminal.

The status off the functions can be check through:
Handheld terminal:

- In the main menu press “E”

FM Master



FM Slave

OST Builder

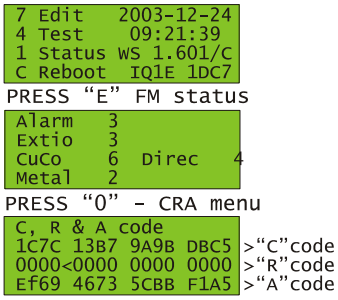
- In development

EASi/Net data base (decisive)

- In development

3.5 Field upgrade with CRA

- Need: Handheld terminal and connection to EASi/Net
  (when no internet connection available, please call the EASi/Net colleague in your country)
- To upgrade the unit follow the CRA protocol
  - C challenge
  - R response
  - A acknowledge



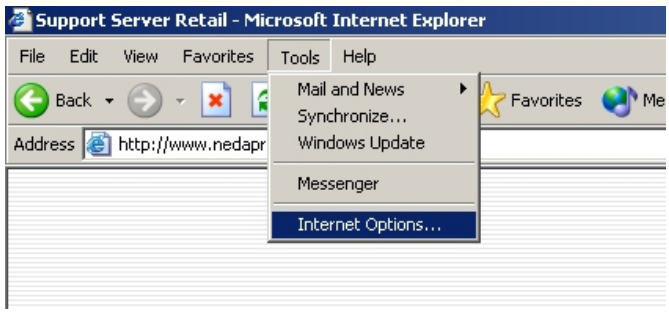
Challenge : write down the hardware address and find out the "C" code of the PCB. Send these numbers to the EASi/Net

Response :The "C" will be filled in into the CRA window in EASi/Net
There will be generated a new Code, the "Respons" code.
this "Respons" code has to be filled in into the Handheldterminal

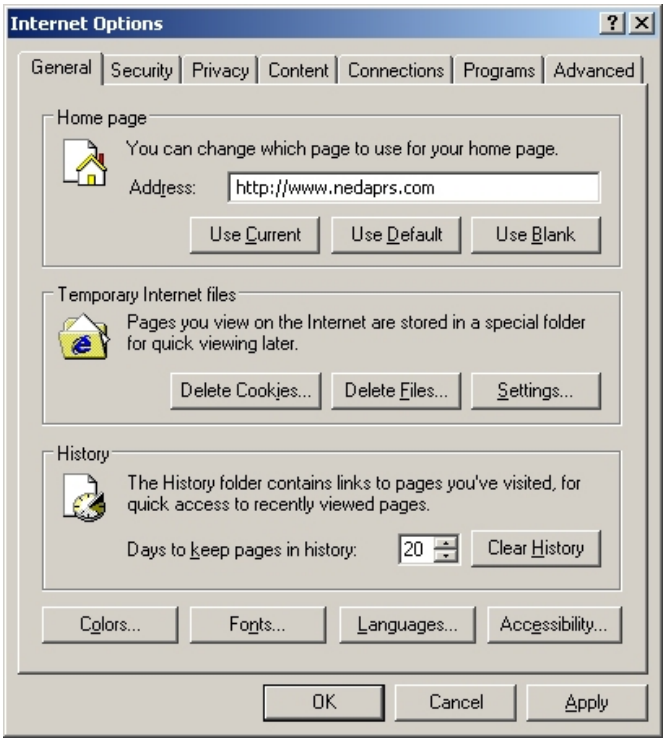
Acknowledge : A new code is generated, the "Acknowledge" code, send this code to the EASi/net and fill it in into the CRA window

CAUTION!
Before starting with the upgrade change the “Temporary Internet Settings” of your pc / laptop.

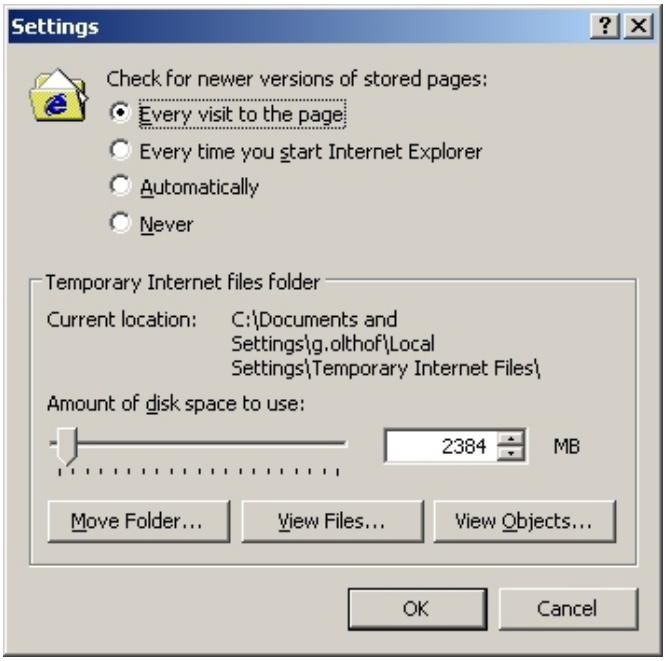
1.



2.

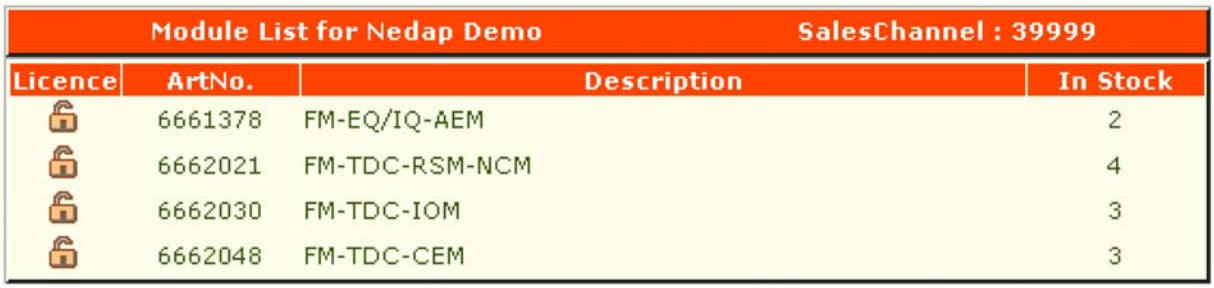


3.



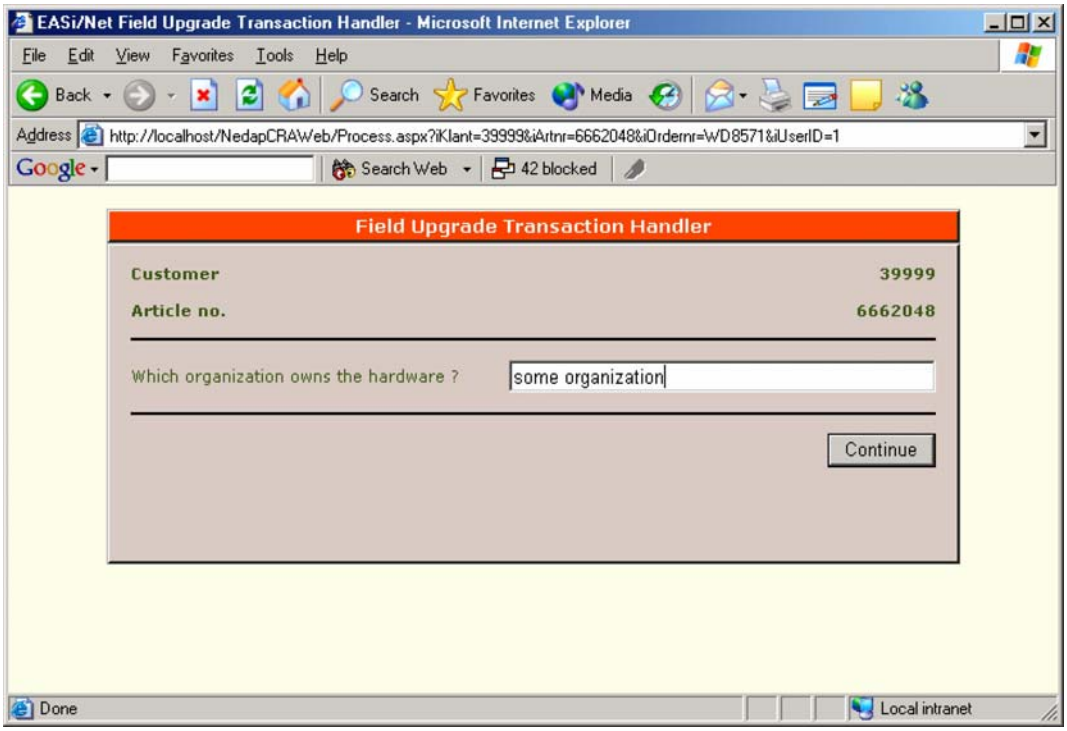
Change the "Check for newer versions of stored pages" to "Every visit to the page"

Step 1: Entering the warehouse of the EASi/Net



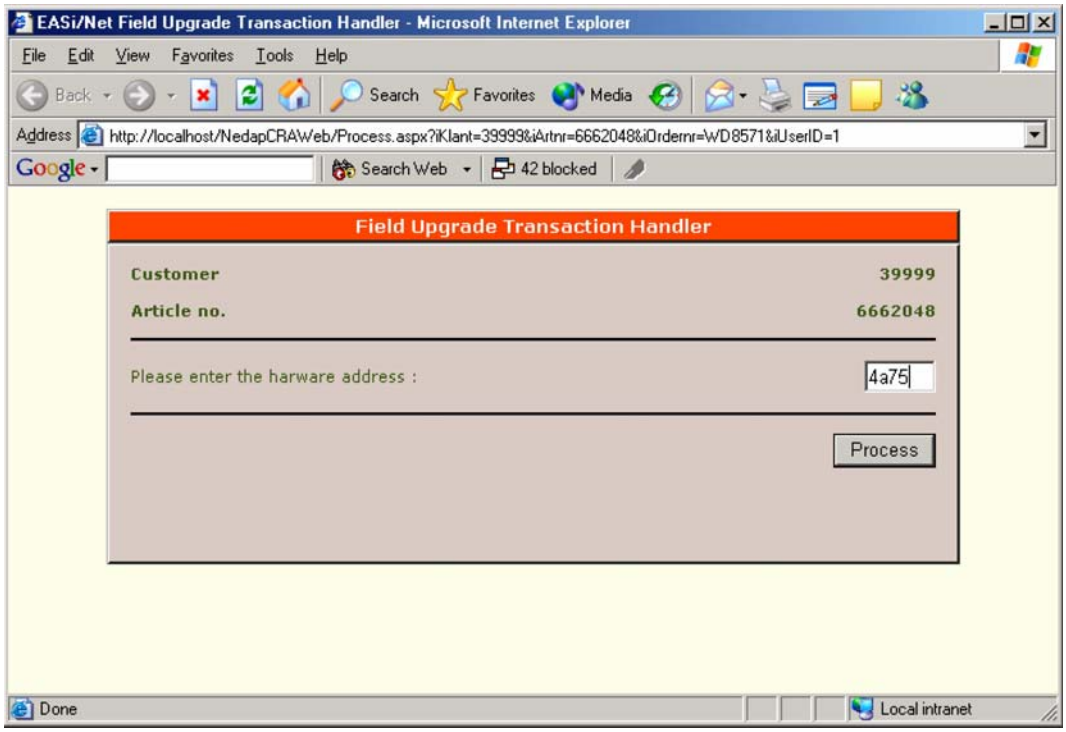
You are now in the Module list. This is a list where are all the Functionality Modules for the installing company are present. Click on the lock of the AEM to enter the Aisle Extension Module upgrade.

Step 2: Fill in the organization name, store name and / or the StoreID



Click the button “Continue”

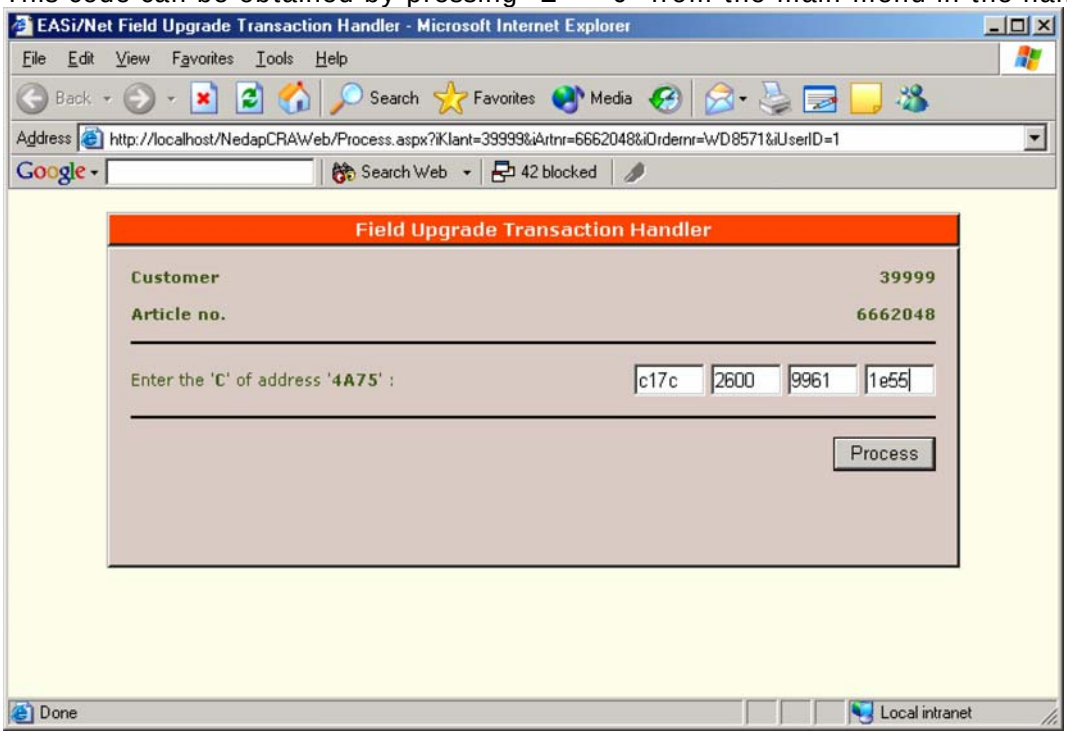
Step 3: Enter the hardware address of the unit which has to be upgraded.



Click the button “Process”

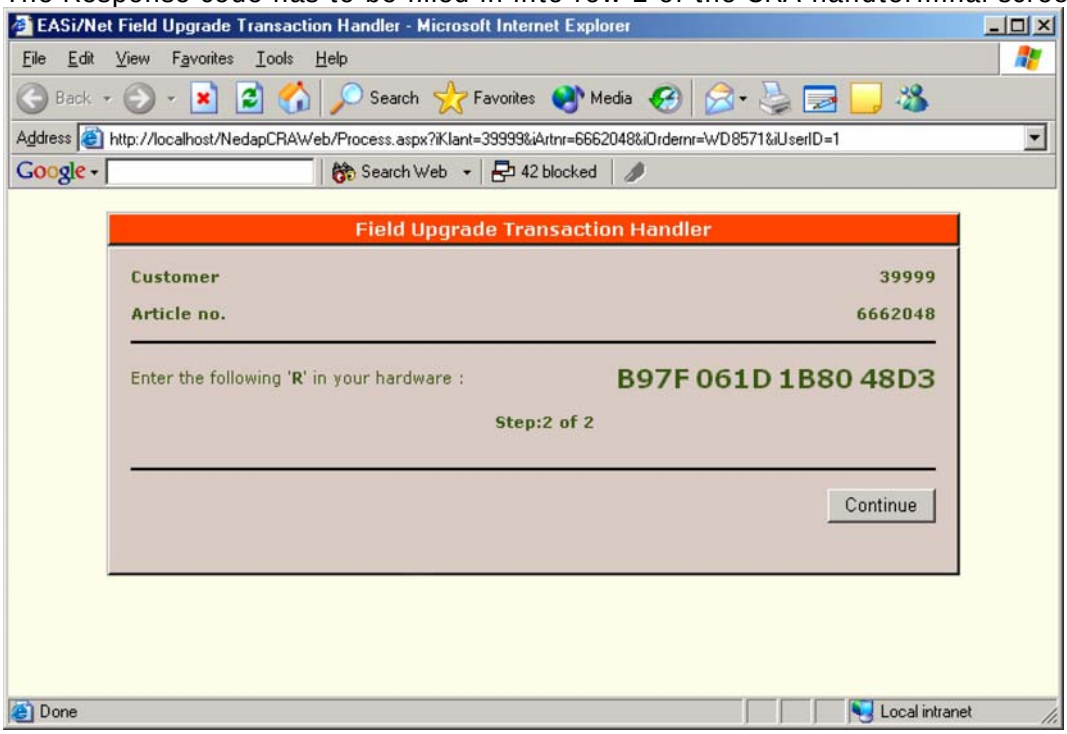
Step 4: Enter the “C” code of the unit.

This code can be obtained by pressing “E” - “0” from the main menu in the handterminal.



Step 5: Obtaining the Respons code

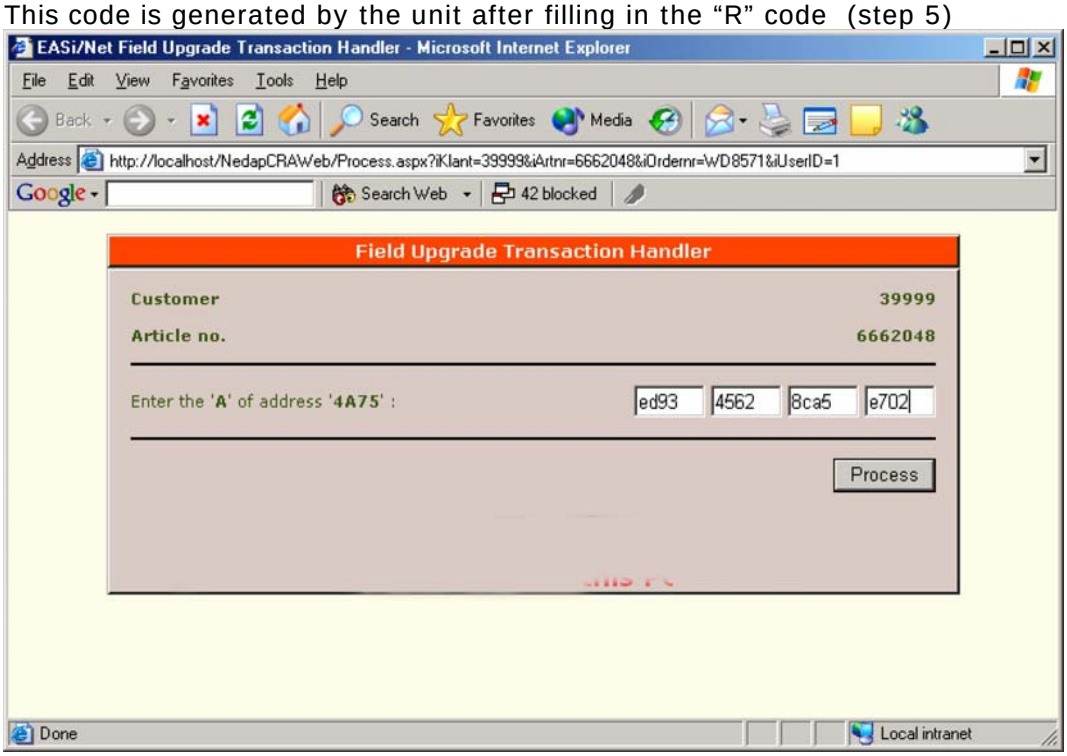
The Response code has to be filled in into row 2 of the CRA handterminal screen



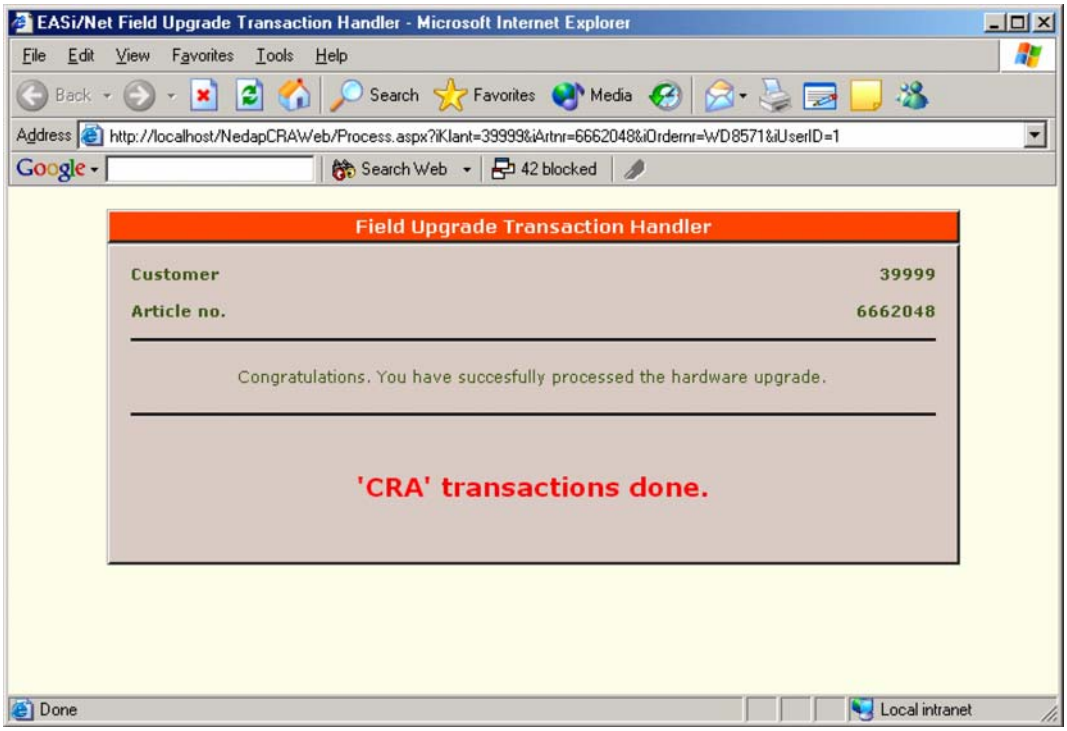
Press “Continue”

Step 6: Obtaining the Acknowledge code

This code is generated by the unit after filling in the “R” code (step 5)



Click the button “Process”


EASi/Net Field Upgrade Transaction Handler - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://localhost/NedapCRAWeb/Process.aspx?iKlant=39999&iArtnr=6662048&iOrdernr=WD8571&iUserID=1
Google Search Web 42 blocked
Field Upgrade Transaction Handler
Customer 39999
Article no. 6662048
Congratulations. You have succesfully processed the hardware upgrade.
'CRA' transactions done.
Done
Local intranet

3.7 The Functionality Modules

AEM= Aisle Extension Module
(IQ) Extend the antenna-outputs with one aisle
CCM= Customer Counting Module
(IQ) Collect the Customer Counting data on the EASi/Net
CEM= Channel Extension Module
(TDC) Extend the channels of the TDC with one channel
CRA= Challenge - Response - Acknowledge
DCM= Data Collection Module
For collecting data from the system into the EASi/Net
IOM= Input - Output extension Module
NCM= Network Connection Module
Bridging between the units
RSM= Remote Service Module
Module for remote service of the system

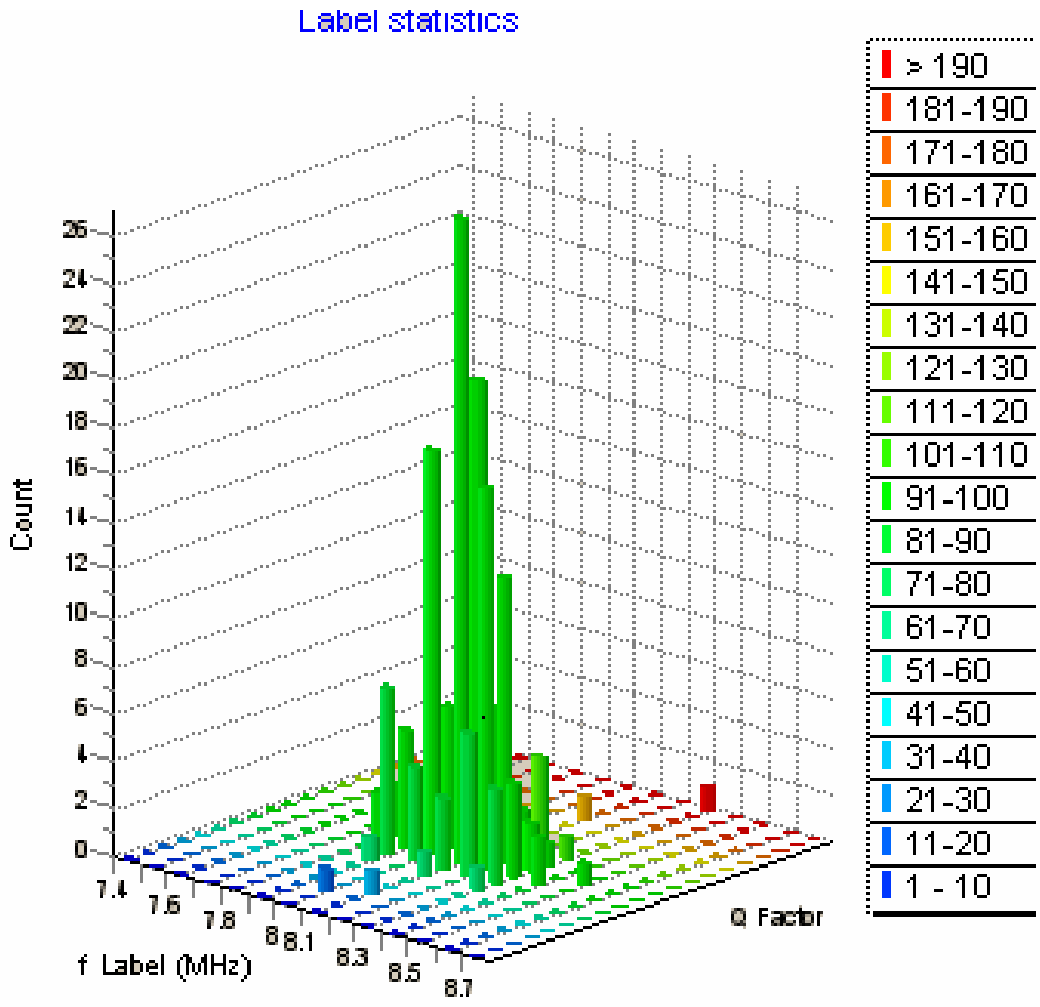
4. Remote servicing

Like the other OS/T electronics, remote servicing, is available. Through the integrated RS232 connector it is possible to control and service the TDC. It is also possible to update the firmware or to upgrade Functionality Modules by internet.
Full OS/T-builder compatibility for remote diagnostics and adjustments:

- Detection sensitivity
- Deactivation power
- Remote on/off
- Output/ input settings
- Q-factor level hard-/paper tag detection
- Tag detection and deactivation statistics like Q-factor, frequency, FTD's

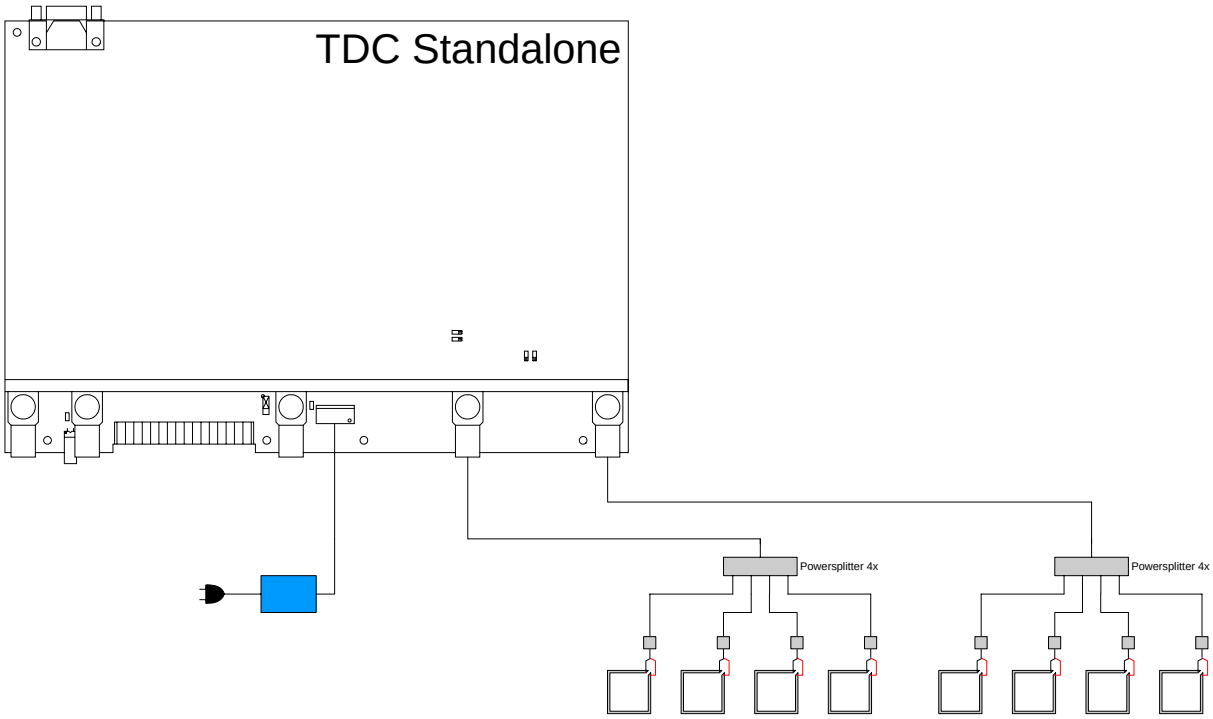
5. EASi / Net™

When having a modem connected to the TDC it is easy to monitor deactivations and tagging efficiency & tag quality control and more.



7. Antennas

The TDC is suitable for various deactivator antennas.



8. Inputs / Outputs

There are In- and outputs for easy connection to POS (**P**oint **O**f **S**ales), Nedap web detachers, cameras, etc.

Version A

Connector K10

1	Relay2 C
2	Relay2 NO
3	Relay2 NC
4	Relay1 C
5	Relay1 NO
6	Relay1 NC
7	+6 Volt DC
8	Aux2 in (counting detacher)
9	Aux1 in (counting detacher)
10	Opto1 in(+)
11	Opto2 in(+)
12	Opto 1 and 2 Common (-)
13	I2C Sda
14	I2C Scl
15	+33Volt
16	Gnd

AUX1,AUX2 in specs

Both inputs have internal pull-up resistors and can work with a switch to ground
In case of an active input signal: Max input voltage 6V.

Opto 1,2 specs

Input voltage between 5V dc and 33V dc

Version B

Connector K10

1	Relay2 C
2	Relay2 NO
3	Relay2 NC
4	Relay1 C
5	Relay1 NO
6	Relay1 NC
7	Aux2 in (counting detacher)
8	Aux1 in (counting detacher)
9	Opto1 in(+)
10	Opto1 in(-)
11	Opto2 in(+)
12	Opto2 in(-)
13	I2C Sda
14	I2C Scl
15	+33Volt
16	Gnd

Connector K12 (counting detacher)

1	+33Volt
2	Aux2 in
3	Gnd

Connector K13 (counting detacher)

1	+33Volt
2	Aux1 in
3	Gnd

AUX1,AUX2 in specs

Both inputs have internal pull-up resistors and can work with a switch to ground
In case of an active input signal: Max input source current 10 mA or max input voltage 6V.
Connector K10 pin 7,8 and Connector K12,13 are in parallel, only one can be used at a time.

Opto 1,2 specs

Input voltage between 5V dc and 33V dc