VE2D

Van Ettinger Electronic Design / The Netherlands

Curriculum Vitae Norbert van Ettinger
Senior developer of analogue and digital electronics and software

English Version

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Index

1   Document data

1.1   Revision history

Version	Date	Author	Remarks
001	20-12-2011	Norbert van Ettinger	First version (Dutch)
002	28-01-2015	Norbert van Ettinger	Definitive (Dutch)
003	17-09-2015	Norbert van Ettinger	Modified (English)
004	22-10-2018	Norbert van Ettinger	Modified (English)
005	21-02-2019	Norbert van Ettinger	Modified (English) Summary
006	25-01-2022	Norbert van Ettinger	Modified (English) Summary

1.2   Document / website references

REF	Description Source	Characteristic / website / doc	version
001	Website Norbert van Ettinger	http://www.ve2d.nl	January 2015
002	Website Vialis Railway Ind.		
003	Website ARS T&TT		
004	Website NEDAP		
005	Website Mixtuur		
006	Website STN BV		
007	Website VDC		
008	Website Bosch (previous Philips Breda)	boschsecurity.com/	
009	Website RENA electonica BV		
010	Website Differ	https://www.differ.nl/	
011	Website PalmSens	https://www.palmsens.com/	

1.3   List of Abbreviations

ANABEL	Adaptive Electronic Railway Crossing Bell
ASL	Ampco Sound LAB (firma)
CAD	Computer Added Design
CRS	Customer Requirement Specification
FMEA	Failure Mode and Effect Analysis
HLO	Hoger Laboratorium Onderwijs
HRS	Hardware Requirement Specification
MTBF	Mean Time Between Failure
RAMS	Reliability Availability Maintainability Safety
SRS	Software Requirement Specification
TPD	Technical Product Documentation
UU	University of Utrecht
VE2D	Van Ettinger Electronic Design

2   Global overview

2.1   Introduction

Schooled in technology I am designing for more than 30 years analogue and digital electronics including embedded software. First as pay roller, since 1999 also as freelancer I assist Clients / Employers transforming their ideas into designs which are ready for production. Besides being educated in electronics I graduated at the University of Utrecht with an academic Master degree in Philosophy. The resulting broad orientation in study and work-experience prepares me for good technical insight, accurate communication skills and an extensive perspective on the relation humans, technology and society. With pleasure I put these competences in service of a sustainable, and economical realisation of technical projects.

2.2   Personal Data

Name	: Ettinger van
Surname	: Norbert
Date of Birth	: 23-05-1960
Place of Birth	: Harderwijk (the Netherlands)
Nationality	: Dutch
Address	: De Ness 27
Zip code / place	: 3461GD Linschoten
Mobile	: +31 623513405
Website	: http://www.ve2d.nl
Email	: nvettinger@hotmail.com

2.3   History

This curriculum aims to present an outlook on the services I can deliver, by explaining my expertise, competences and know-how by means of a short description of what I have realized in the past.

As a child I already had my predilection for technology. Always busy I crafted my first radio at an age of 11. After a study in chemistry (HLO) and electronics (HTS) I started 30 years ago as an electronics designer and software programmer first only in pay rolled functions but since 1999 also as freelancer on project basis. My career as developer began in 1990 at Ampco Sound Lab (ASL, the Netherlands) in a team of designers developing intercom equipment for the entertainment industries (theatre, radio and television broadcast studio's). First responsible for the development of embedded software later on I started also designing the hardware. At the end it encapsulated the whole trajectory of designing and drawing schematics, making the PCB layout, developing the software, building and testing prototypes and managing assembly for production. Those activities I continued at my subsequent employer, Philips CSS Breda Holland (nowadays Bosch Security Systems). There I was first lead designer of an analogue congress-system, later on a member of a team developing a Public Address System.

Philips Holland was a good teacher because of the many technical facilities and colleagues with a huge amount of experience from whom I learned a lot. This business unit of the Philips company had her own assembly line, anechoic rooms for audio- and for EMC testing where I did spent a lot of hours testing my designs. In these period I become also acquainted with a thoroughly structured design path with milestones and a solid method of documenting (in *HRS*, *CRS*, *TPD*, etc.) After four years of building experiences at Philips I received the opportunity to start for myself as freelances with a couple of orders to start with. From that moment of I realised for several clients a diversity of digital and analogue design projects (See 5.3). Examples are the hard- and software development for ICT purposes like Tracking and Tracing, roadside automatization and automotive applications. Beside that I designed audio equipment, power supplies, electro motor controllers, and LED drivers.

In all these projects I assisted the client with formulating functional and technical specifications, which has been worked out in operational prototypes, and subsequent assembly of smaller and larger production series in association with assembly companies. Schematics has been drawn in Altium, Ultiboard, ORCAD, Cadence, Layo, Mentor Graphics or Futurenet. Embedded software has been written in C and C++ for several micro controllers : (8051 derivatives of Intel, Siemens, Philips, Atmel, PIC processors, Rabbit, TI MSP430).   Designs have been built, and/or simulated in SPICE. Reliability and lifetime (RAMS and MTBF) has been calculated, practical tested and documented. Required documents like CRS, SRS, HRS, TPD, BOM and assembly instructions and in some cases safety documents have been written. Accordingly experience has been gained during the last 30 years in all the activities needed to transform an idea into a ready to be manufactured design that full fills all the legal, functional and technical requirements.

Here after you will find a concise summary of my experiences and competences. At the end a list of realised projects is included.

3   Expertise and competences

I have extensive experience with designing analogue and digital electronics including embedded software.

3.1   Design of digital electronics and embedded software

Serious knowledge of Micro-controller systems and building hardware and writing software around a core of:

- 8051 family controllers
- PIC processoren
- SGS Thomson controllers
- Rabbit Controllers
- Z80 derivative
- TI MSP430 low power processors
- Atmel AT Mega and SAM controllers.
- Experience with applying hard- and software in Wireless applications using GSM, GPRS, GPS and Bluetooth!
- Knowledge of implementing communication protocols like I2C, SPI, RS232, USB
- Mastering Programming languages like: C++, en C, Pascal, Basic, Cobol, HTML, PLM
- Experience with application of embedded systems in ICT, Telematics, Information technology, Tracking & Tracing and Automotive devices.
- Knowledge of very low Power applications, stand alone devices current supplied by means of electrical photovoltaic solar panels, or by means of an electrical generator driven by wind or human motion.
- Acquainted with object oriented programming; knowing how to work with Classes and structures in C++. Familiar with Kernighan and Ritchie's "C handbook".

3.2   Design of analogue electronics

- Knowledge of application of semiconductors like Transistors, (power)Mosfets, IGBT's, Triac's, opamps, comparators etc.
- Broad experience with designing analogue electronic circuitry for application in audio, and optics.
- Acquainted with the meaning and application of concepts of acoustics like sound pressure level (dB SPL @1m), A weighted , Crest factor etc.
- Experience with sound measurements in anechoic rooms (Philips and Vialis).
- Know how in designing analogue and switch mode power supplies like DC-DC and AC(mains)-DC flyback converters.
- Experience in application of LED's and LED driver electronics in signalization & illumination.
- Acquainted with optical measurements in light-streets.
- Experienced in designing electronics for controlling DC motors.
- Acquainted with design of electronics for harvesting electrical power from electrical generators.

3.3   Skills in CAD tooling

- Experienced in drawing schematics, PCB layout and PCB routing in Altium, Ultiboard, Layo, and Orcad
- More than 100 schematics and PCB's designed.
- Since 2017 being an IPC certified hardware designer.

3.4   Hands on prototyping and assembling on component level

- Familiar with procedures for ordering and buying components.
- Hands-on mentality. Not only the head but also the hands:
- Having the skills to built prototypes including the mechanical work.
- Good craftsmanship.
- Capable of Soldering (also of SMD).
- Capable of Milling, Drilling etc.

3.5   Simulation, testing and debugging

- Know-how in structured testing and measuring the performance of electronic prototypes and comparing with requirement specifications.
- Familiar with computer simulation, spice programs (LT-spice), measuring devices like oscilloscope, spectrum-analyzers, Fourier analyses, bode-diagrams, measuring step-responses for estimation of stability.

3.6   CE / EMC certification

- Being able to take care of the whole trajectory required for EMC certification.
- Gained experience in practical measurements at Philips, RENA and PalmSens
- Measured a lot of equipment at Philips, test-house DARE, RENA and PalmSens.
- Experienced in setting up test environment for preliminary EMC testing.

3.7   IECEE & UL certification

- Familiar with procedures required for IECEE & UL certification of LED driver design

3.8   Life Cycle testing

- Being able to setup a lifecycle test program and to test a prototype in an (accelerated) life cycle test in order to determine lifetime of products (experiences gained at RENA Electronica BV)

3.9   Documentation and quality control

- Skilled in writing technical documentation (HRS, SRS, TPD, BOM, Test-reports, Assembly instructions)
- RAMS calculation and safety cases.
- Having the skills to set up and conduct FMEA audits

3.10 Experiences built up as freelancer

Autonomy
- Having learned to work autonomously on project. I accept my job and carry it through the whole trajectory without losing sight of the need for regular communication with clients and relevant team-members.

Innovative in Research and Development
- Having experience with designs requiring an innovative and creative approach.

Financial and logistics controll
- Experienced in managing, controlling, budgeting and administering financial resources and logistic transaction to support the business.

3.11 Personal characteristics

- Autonomous / independent
- Creative (out of the box thinker)
- Analytical
- Good practical crafts and hand-skills
- Perseverance
- Good verbal and writing communication skills
- Eager to learn new things and applying new techniques
- Auto didactical
- Structured work ethos

4 Education

4.1 Professional Education

Period	Education	Specialisation	Institute	Diploma
2013-2018	Philosophy	Academic Master	UU University of Utrecht	MA (Master of Arts) 2018
2002-2007	Philosophy	Common Major trajectory	UU University of Utrecht	BA (Bachelor of Arts) 2007
1988-1994	Technical High School (HTS)	Electronics (Technical Computer Science)	P.B.N.A.	Certificates 1988-1994
1981-1986	H.L.O.	Chemistry	Ghijsen Instituut Utrecht	1986

4.2 Basic educations

Period	Education	Specialisation	Institute	Certificate
1978-1979	PA	(Pedagogische Academie)	St Jozef P.A / Zeist	-
1979-1981	VWO	En, Sk, Bi	Bonifatius / Utrecht	Certificates 1981
1976-1978	HAVO	En, Sk, Bi, Nk, Wi,, En, Ne	De Breul / Zeist	1978
1972-1976	MAVO	En, Sk, Bi, Nk, Wi,, En, Ne	De Breul / Zeist	1976

4.3 Courses

Period	Education	Specialisation	Institute	Diploma
April 2017	IPC course	Certified IPC HW Designer	PIEK	Certficate,April 2017
1987 may-aug	Computer programmer	Structured programming in COBOL	Ordina	Certificates august 1987

4.4 Current studies / courses

Period	Education	Specialisation	Institute	Certificate
2018-	Self-education	Windturbine design	-	-

4.5 Explanation of above education traject

The study at the Hogere Laboratoriumschool (1981-1986) makes me acquainted with the computer when learning to program it in Basic and Pascal. This arouses my interest for ICT. With the desire to extend my knowledge I follow subsequently the training "Structured Programming" (1987) at ORDINA, which encapsulates the AMBI modules I1, I2, B1 and T2. Wanting to take my career into designing electronics and working with computer technologies I follow the study technical computer science at the PBNA Technical High School (1988-1994). Followed courses included: DC and AC electricity theory, mathematics, Fourier transformations, digital signal processing, semiconductor technology, electrical circuit theory, switch-phenomena, designing analogue and digital circuitry, microcomputer technology, programming the 68000 microprocessor, programming in assembly and C, compiler design, etc. Finally in order to broaden my scope I followed a study philosophy (Academic Bachelor [2002-2007] and Academic Master [2016-2018]) at the university of Utrecht.

Title: Curriculum Vitae Norbert van Ettinger

De Ness 27 3461GD Linschoten The Netherlands

January 2022

Tel +31 623513405

Ver: 006

http://www.ve2d.nl

Status: Definitive

nvettinger@hotmail.com

5   Work experience

5.1   concise overview

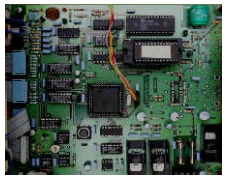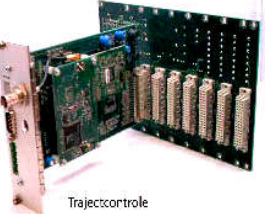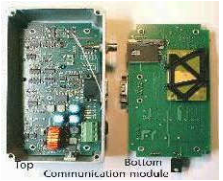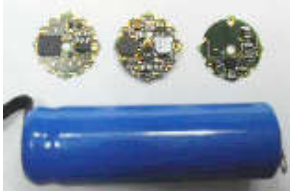| Period	Employer	Function	Description
1999-2019	*Van Ettinger Electronic Design (VE2D).*	Entrepeneur & Analogue and Digital Electronics developer & programmer	• Hardware design of analogue and digital equipment. • Scheme and PCB lay-out design. • Assembly of PCB's, prototypes and small series . • (Deep) Embedded Software design
1998-1999	Philips CSS Breda	Electronics developer	HW development of Public Address system
1996-1998	Philips CSS Breda via Multec	Electronics- lead designer	Electronics lead designer of an analogue congress system
1990-1996	Ampco Sound Lab	Electronics designer programmer	Development of electronics, software and housing of professional intercom equipment.
1988-1990	TKM Leusden	Software / hardware support engineer	Installation and maintenance of computer hardware and software on client location.
1986-1987	Miscellaneous	Analyst working in Chemical labs	Survey in chemical composition of bottom ground samples
1979-1981	Uitzendbureau	Production worker	Simple production-work

Linschoten (NL), 25 January 2022

Drs, ing Norbert van Ettinger
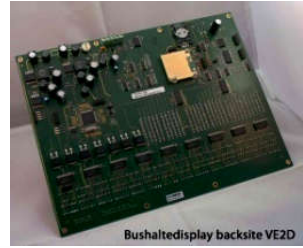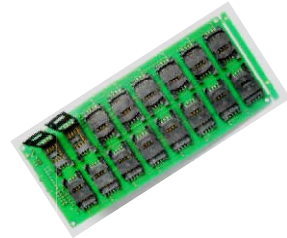De Ness 27
3461GD Linschoten / The Netherlands

website : http://www.ve2d.nl
email : nvettinger@hotmail.com

mobile phone   +31 6-23513405
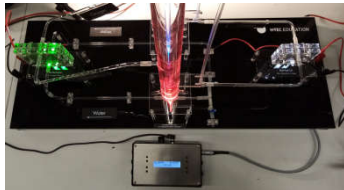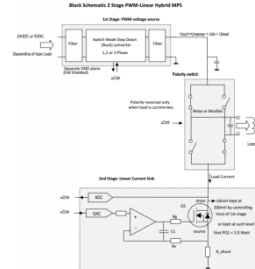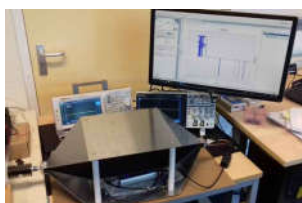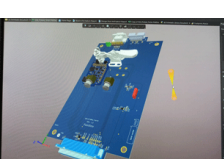
6   Portfolio realised projects

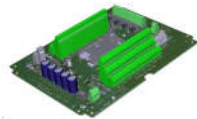| Period	Employer/Client	Function	Project	Visual impression
1988-1990	**TKM Leusden**	Support engineer,	Maintaining computers, peripheral equipments and SW at customers sites	
1990-1996	**Ampco Sound Lab**: Designer and manufacturer of Professional intercom equipment for the entertainment industry.	Electronics Hard and Software developer	Developing Electronics and software for several intercom modules. Writing embedded software in Intel PLM, Assembler, C, for 8051 and Thomson ST6 micro-controller systems.	2 channel beltpack
1996	**Voorhout Data Connection** Harmelen VDC; Developer/manufacturer of Telecom equipment	Hardware/Software designer	Designing hardware and software for a matrix main station unit for connecting handsets of Siemens Transceiver for the TRAXYS network.	
1996-1997		Analogue and Digital Electronics Developer	Development of PWM controller and driver for electromotor of small electrical driven vehicle.	
1997	**Voorhout Data Connection** Harmelen VDC; Developer/manufacturer of Telecom equipment	Hardware/Software designer	Developing as Hardware designer 80C552 ctrl board. Developing as programmer embedded software in C++, (on Kyle compiler) for Cable television-HF-converter-equipment	
1996-1998	**Philips CSS** Breda (now Bosch). Developer and manufacturer of congress- and P.A. systems	Analogue electronics Lead Designer	Designing CCS800 analogue congress system using analogue and discrete digital electronic components though no programmable logic.	Delegate unit CCS800
1998-1999	**Philips CSS** Breda (now Bosch). Developer and manufacturer of congress- and P.A. systems	Digital Hardware designer Public Address system	Designing in a dedicated team a Public Adress System	
2000-2009	**STN BV**, Hulst. Developer manufacturer of HF cable-TV converters. The Netherlands	Hardware/Software designer	HW designed for Ctrlr boards with 80C552 MCU. Several embedded software modules written in C++ for several HF cable converters.	Ctrlr board
2000	**Voorhout Data Connection** Harmelen VDC; Developer/manufacturer of Telecom equipment	Analogue and Digital Hardware designer and C++ developer of embedded software.	Development of hardware and software of a 6 channel audio-matrix controllable by PC via an RS232 link.	

Period	Employer/Client	Function	Project	Visual impression
2001-2002	**ARS T&TT** Leidschen-dam/Den Haag (end-user Prorail)	Analogue- Digital designer / software programmer	Development of on Board Tracking and Tracing device for Prorail, for application in locomotives of Dutch railway company (Nederlandse Spoorwegen) Applied processor: PC104 card, I/O : glue IC's and Quad UART on AT bus, Wavecom GPRS module, and uBlox GPS module.	
2003	**ARS T&TT** Leidschen-dam/Den Haag (end-user Prorail)	Electronics Hardware-developer	GPS module for laptop	GPS Module
2002-2003	**STN BV**, Hulst. Developer manufacturer of HF cable-TV converters. The Netherlands	Analogue- Digital designer / software programmer	Development of programmable audio-amplifier including compressor and limiter function: Design based on 80C552 MCU, software developed on C++ Keil compiler platform.	
2004-2005	**ARS T&TT** Leidschen-dam/Den Haag (end-user Prorail)	Hardware Designer of digital Electronics and developer of embedded software	Developing Timestamp Card for 'traject-controle' : electronic speed control on Dutch highways. Applied MCU: Rabit MC3000, Software written in C++, GPS module TC65	Trajectcontrole
2006	**ARS T&TT** Leidschen-dam/Den Haag (end-user Prorail)	Hardware Designer of digital Electronics and developer of embedded software	Developing hardware for GPRS communication module for traffic counter. Applied MCU: 8051 derivate with flash, Programmed in C++ with Keil compiler.	
2007-2008	Ingenieursbureau **NEDAP** Groenlo	Hardware Designer of digital Electronics and developer of embedded software	Development of Hard- and Software for small scale electronics in 1.5V AA battery converting internal 3.7V Li-ion into 1.5 Volts on the outside. Applied MCU: TI MSP430. Programmed in C++	

Period	Employer/Client	Function	Project	Visual impression
2009-2010	**ARS T&TT** Leidschen-dam/Den Haag (end-user Rijkswaterstaat)	Digital electronics designer / software programmer	Development of Time-stamp chart for Trajec-tory controll with dynamic maximum speed. Applied MCU: Rabbit MC3000. Communica-tion: Ethernet, Soft-ware written in C++ module.	
2009-2010	**ARS T&TT** Leidschen-dam/Den Haag (end-user Veolia)	Electronics Hardware software developer	Development of hard-ware and software of a Bus-Stop Display for Veolia displaying travel-information. Applied MCU: AtMega 1280. Communication via GPRS. Code written in C++.	
2010-2011	**Test2Date** Enschede,	Digital electronics designer	Development of SIM card reader multi-plexer, used for testing performances of mobile telephone services. Applied MCU: Arduino open source board (external), Design of PCB with multiplexer and 16 SIM card slots, communication: RS232.	
2011-2012	**Mixtuur Nieuwegein**.	Hardware Designer of digital Electronics	Designing hardware of DSP board. for a virtual Pipe Organ.	
2011	**Thales Huizen**	Analogue and Digital electronics hardware designer.	In a team working on analogue and digital design of military audio communication equip-ment.	
2012	**ARS T&TT** Leidschen-dam/Den Haag (end-user Rijkswaterstaat)	Hardware Designer of digital Electronics and developer of embed-ded software	Development of Hard- and Software for a device which uses Bluetooth data (MAC address) of travellers mobiles for estimating travel-time on high-ways. Applied MCU: ATmega 1230, Blue giga Bluetooth module, software written in C++	

Period	Employer/Client	Function	Project	Visual impression
2012-2014	**VRS Railway Industry BV** (Houten The Netherlands)	Hardware Software System Architect: 1) Formulating CRS 2) Validation of design 3) EMC certification 4) Writing safety-case 5) RAMS/MTBF analysis 6) Assembly docs 7) Designing test equipment 8) Dressing up anechoic sound chamber	Development of electronic crossing bell, generating sound by playing sound-sample of a traditional mechanical bell stored in flash memory. The adaptive version delivers a sound pressure level automatically adapted to the ambient sound level.	
2015	**ARS T&TT** Leidschendam/Den Haag (end-user Prorail)	Analogue and digital electronics Hardware developer of inrush current limiter for Prorail track switcher	Development of inrushcurrent limiter for Prorail track switcher based on IGBT's transistors.	
2016-2018	**RENA electronica BV** (Zundert The Netherlands)	Analogue and Digital electronics designer.	Development of several RGBW LED drivers designed with dim-control ability according to the principle of Bits over two power-lines. • PWM modulated constant current driver, with individually controllable RGBW LED's. • Utilizing Bits over power UART enabling control of RGBW LEDS by means of 2 wires (the 48 VDC power-lines). • Based on Atmel SAMD20 processor. • Includes temperature control algorithm keeping temperature of LED's within safe range by de-rating.	
2016-2018	**RENA elektronica BV** (Zundert The Netherlands)	Analogue and Digital electronics designer.	Designing schematic & PCB for 120-230 VAC flyback driver: • dimmable by phasecutting on AC power line and by an 0-10 Volt Dim input. • protected against short-circuits and over-temperature. • proven to be reliable • tested in an accelerated lifecycle test. • EMC pre-compliance tested • Prepared for ENEC & UL certification	
2018	**RENA elektronica BV** (Zundert The Netherlands)	Analogue and Digital electronics designer.	Design of Hardware Kinetic Power-supply for a game facility consisting of LED illuminated floortiles. • Power-supply transforms kinetic energy (jumping people) into electric energy feeding LED's in floor-tiles. • Kinetic tiles equipped with neodymium magnets generator. • Device controlled by Atmel SAM processor. • Higher level control in BEAGLE Bone Board.	

Period	Employer/Client	Function / role	Project	Visual impression
2019-2021	**DIFFER** Dutch Institute For Fundamental Energy Research: Eindhoven, The Netherlands	Analogue & Digital electronics designing and software programming	Development of LED illuminated Solar-Fuel-Demo set, demonstrating generation, storage and consumption of hydrogen & oxygen by using fuel-cells and solar cells. Applied optoelectronics: Illumination Leds, driven by boost driver stepping up 0.8 volt Fuel-cell voltage. Atmel board displays process-efficiency. Software written in C++ module.	 Solar Fuel Demo set up.
2019-2021	**DIFFER** Dutch Institute For Fundamental Energy Research: Eindhoven, The Netherlands	Analogue & Digital electronics designing and software programming	For Current driving Q-poles, steerer and B field compensation of an IBF (Ion Beam Facility) a low ripple output hybrid current supply has been designed and tested in a POC (Proof of Concept). Current supply consists of PWM switching 1st stage and linear 2nd stage.	 Hybrid current source / supply
2019-2021	**DIFFER** Dutch Institute For Fundamental Energy Research: Eindhoven, The Netherlands	Analogue & Digital electronics designing and software programming	Development of H-Bridge 24 Volts / 6 Ampere PWM motor driver.	 H-Bridge Motor Driver
2019-2022	**PalmSens Houten, The Netherlands.** Manufacturer of equipment for chemical analyses.	Setting up EMC test-facility.	Setting up a facility for preliminary EMC testing customer developed products at PalmSens Houten. Setup consisting of spectrum-analyzer, LISN, Tem-Cel, Faraday-cage for measuring EMI emission and immunity.	 Immunity test-setup with TEMcel
2019-2022	**PalmSens Houten, The Netherlands.** Manufacturer of equipment for chemical analyses.	EMC test and consultancy	1) EMC testing PalmSens equipment and giving advise when modifications required. 2) Writing EMC reports.	 TemCel in Faraday cage
2021	**PalmSens Houten, The Netherlands.** Manufacturer of equipment for chemical analyses.	Analogue & Digital electronics designing	Designing a pin bed tester for one of PalmSens' products.	 Pin-bed tester