

IEEE 802.3af DTE Power via MDI

AC disconnect detection

Immunity to Line frequency ad hoc A.I. 3.2

Immunity to ringing signals ad hoc A.I. 3.3

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- Acknowledgments to Pavlik Rimboim and Asher Biton/PowerDsine



Objectives

- Sensitivity of Vac_close to low-frequency electrical field
- Sensitivity of Vac_close to Telecom Ringing frequency
- Testing the immunity of the ac-disconnect detection concept to false disconnect detection



Test setup – PSE side

PARAMETERS:

$C_{pse} = 0.22\mu\text{F}$

$C_{probe} = 10\mu\text{F}$

$R_{pse} = 400\text{k}$

$R_{probe} = 7.5\text{K}$

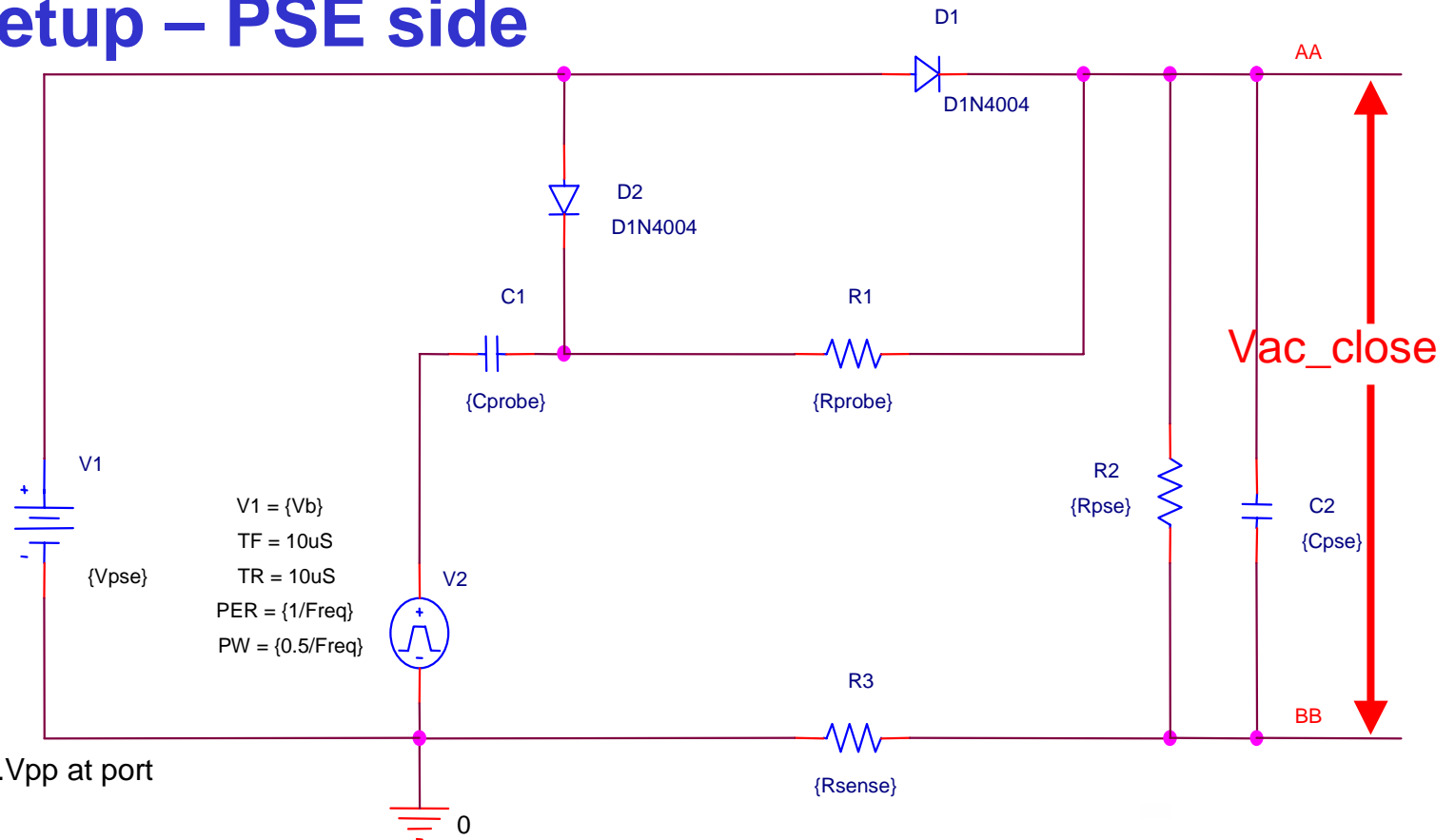
$R_{sense} = 2$

$\text{Freq} = 125$

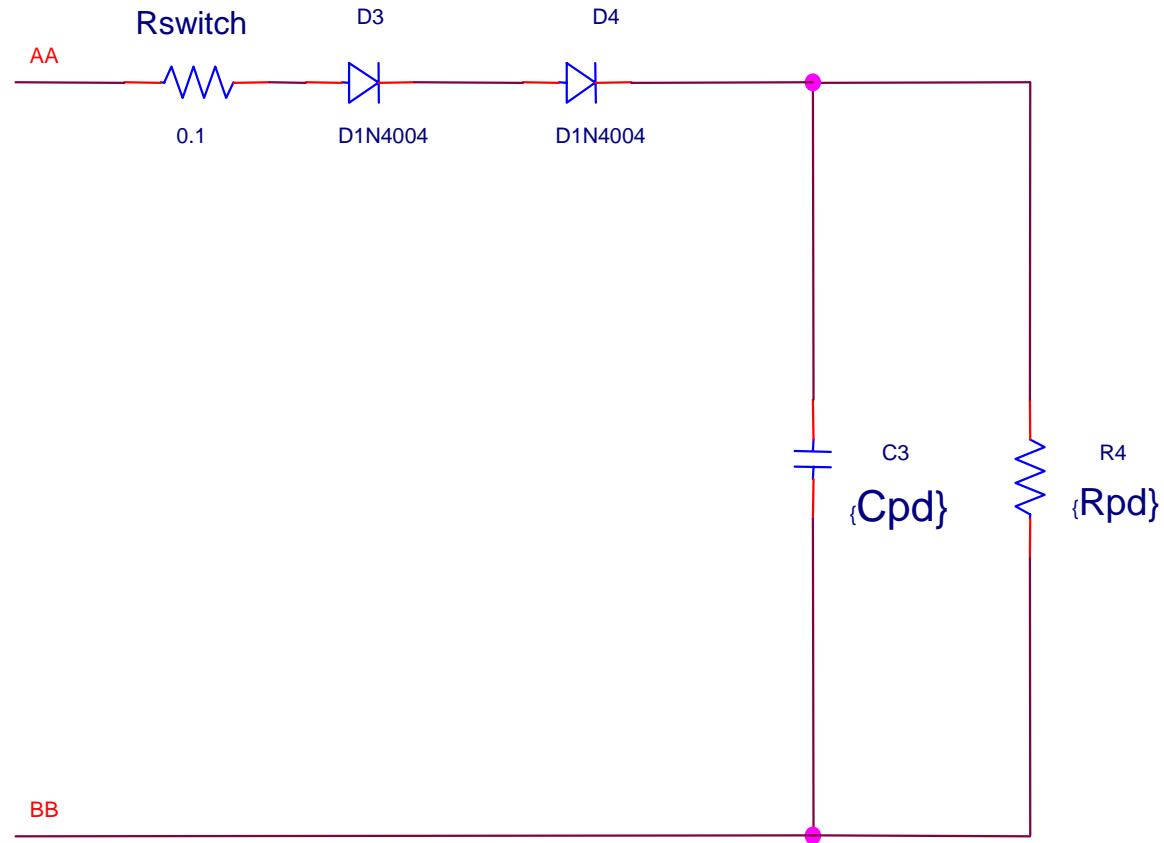
$V_{pse} = 49$

$D1, D2 = 1\text{N}4004$

$V_b = \text{set to have } 4.4 \cdot V_{pp} \text{ at port}$

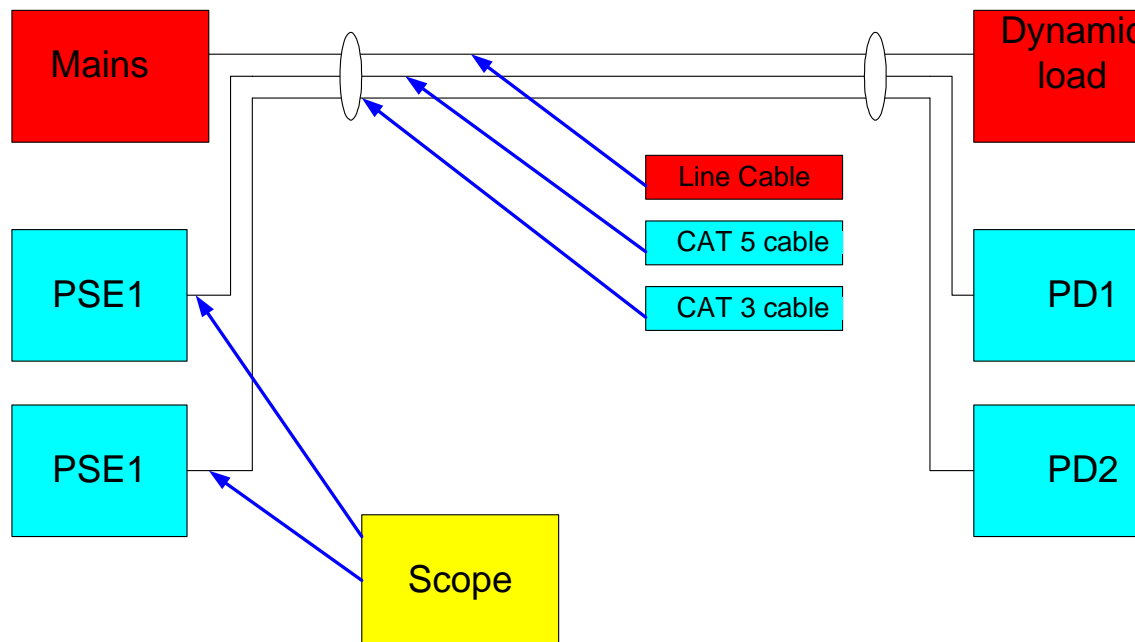


Test setup – PD side



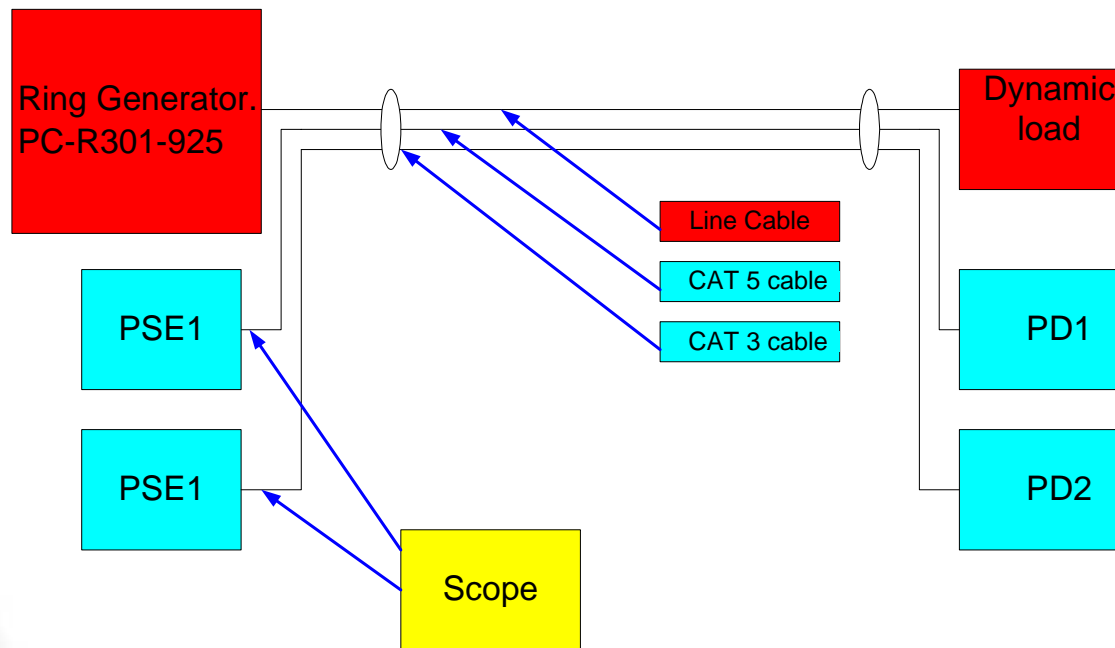
Test conditions and setup – Line Voltage

- Line cable, CAT 5 and CAT 3 cable were wound around wooden Drum. Length = 100m min.
- The line cable connected to mains 240Vac/50Hz and loaded with noise generating load
- PSE port ac voltage was monitored
- AC disconnect-detection functionality was monitored.



Test conditions and setup

- Line cable, CAT 5 and CAT 3 cable were wound around wooden Drum. Length = 100m min.
- The line cable connected to 30W Ring Generator loaded with max load
- PSE port ac voltage was monitored
- AC disconnect-detection functionality was monitored.



AC disconnect detection- Immunity to line frequency, Yair Darshan, PowerDsine. May 2002.

Test results: Immunity to low frequency strong electrical field

Cable Type	Load type	Fluorescent Lamp Ignitions	High Power Inductive load
	Parameter		
CAT 5	Disconnect detection function	Pass	Pass
	Noise level	15.2mV	24
CAT 3	Disconnect detection function	Pass	Pass
	Noise level	18.4mV	28mV



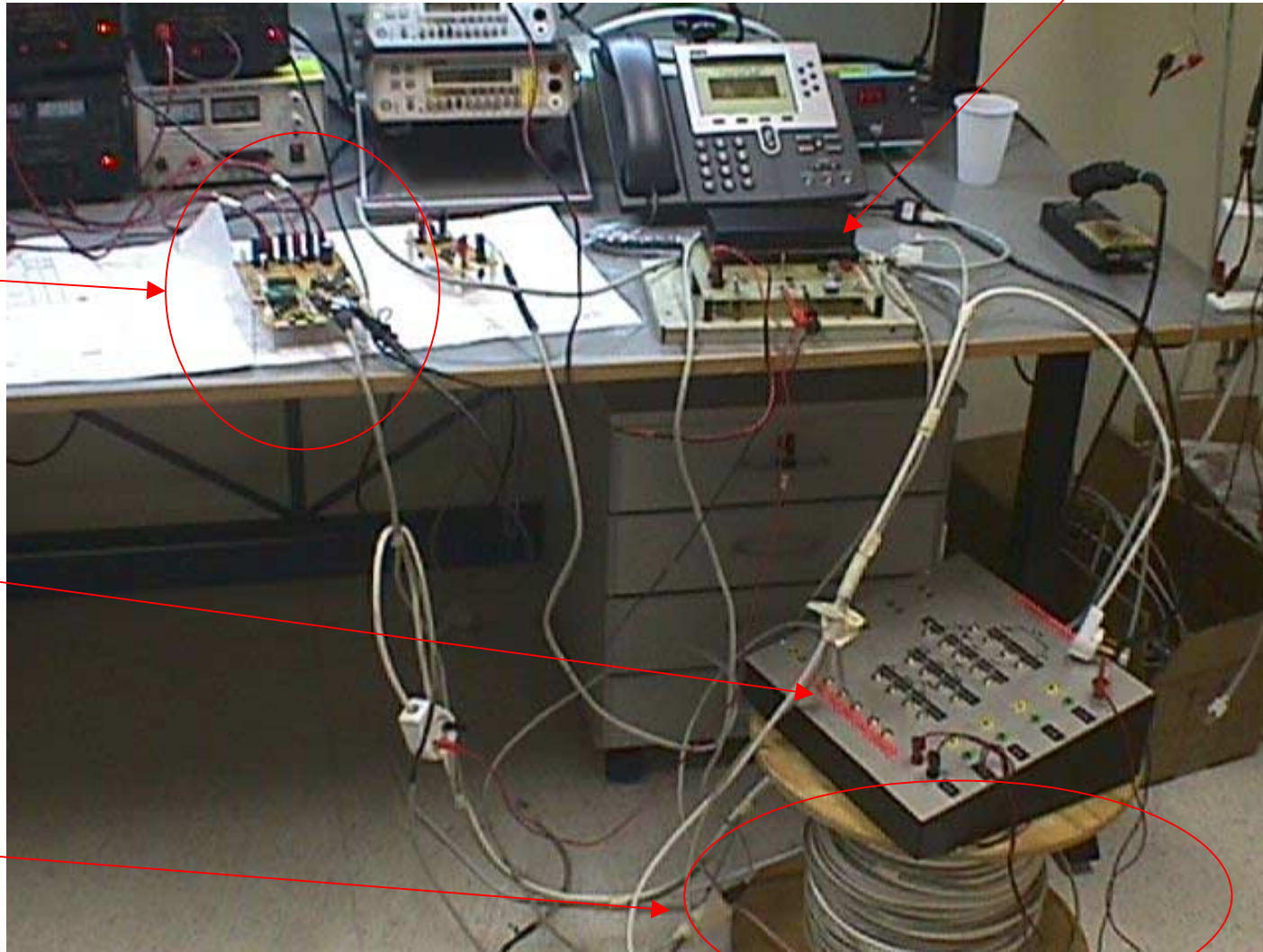
Test Setup

Ring Generator

Single port PSE

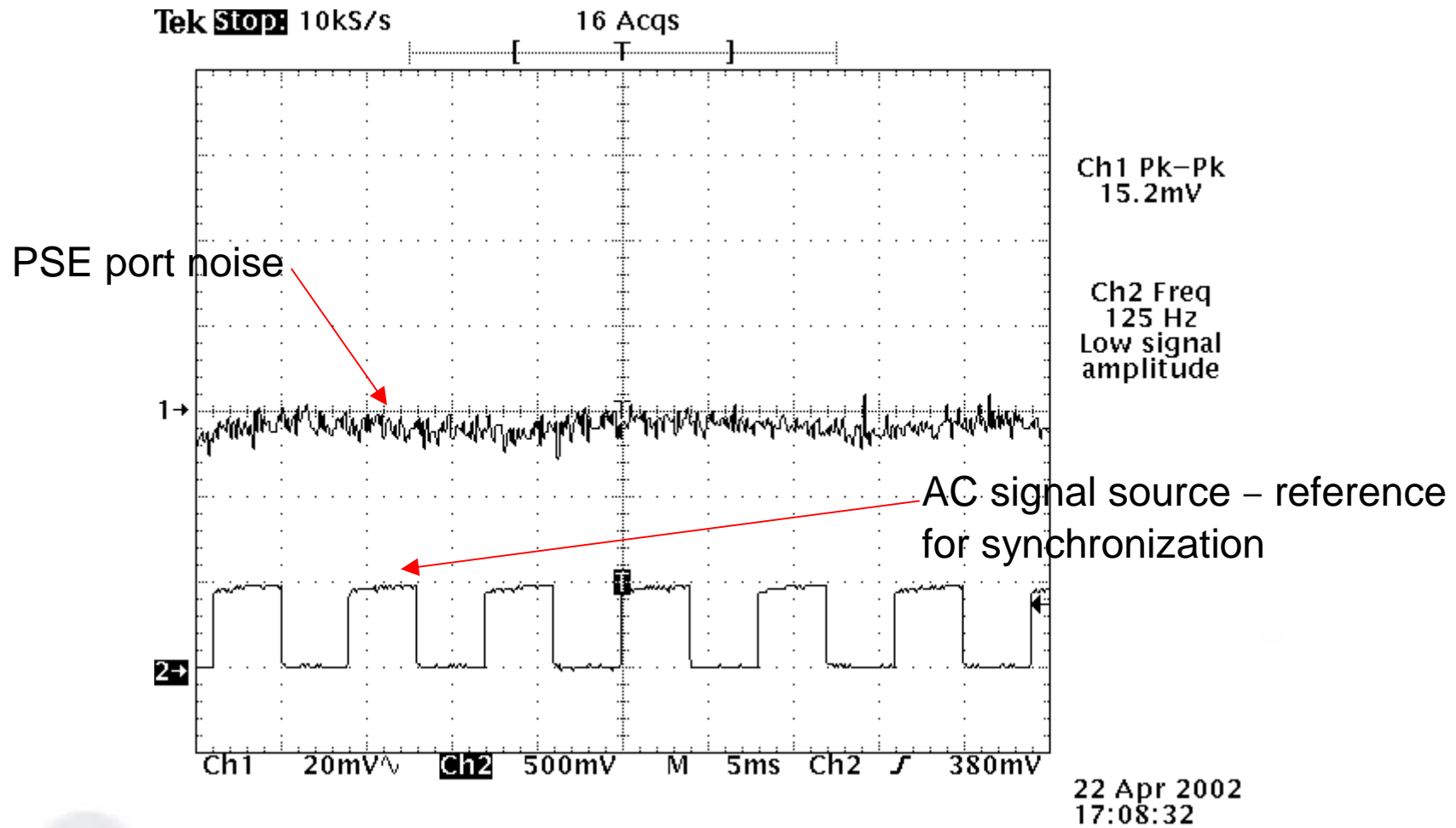
Load Box

Cable setup

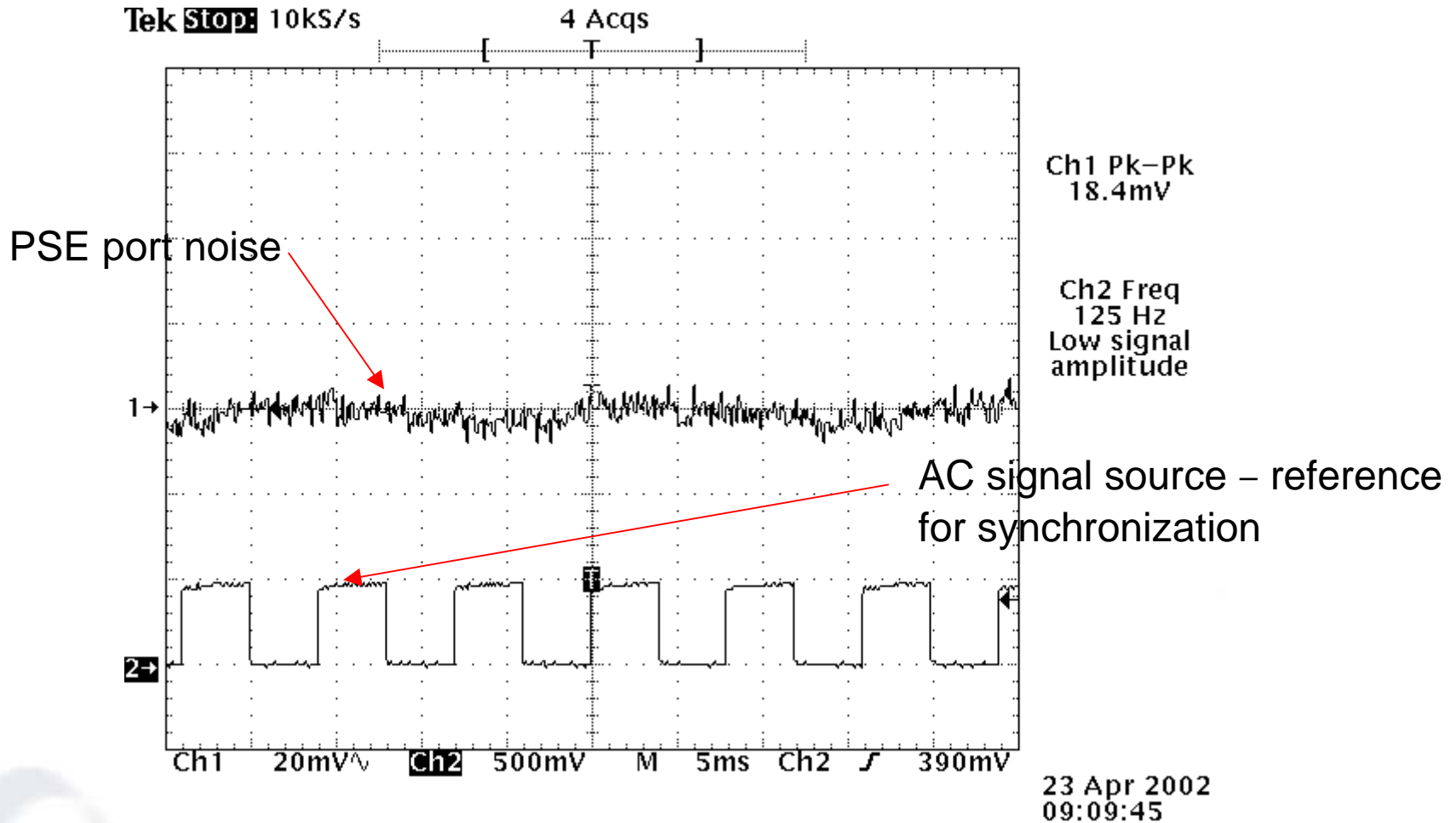


AC disconnect detection- Immunity to line frequency, Yair Darshan, PowerD sine, May 2002.

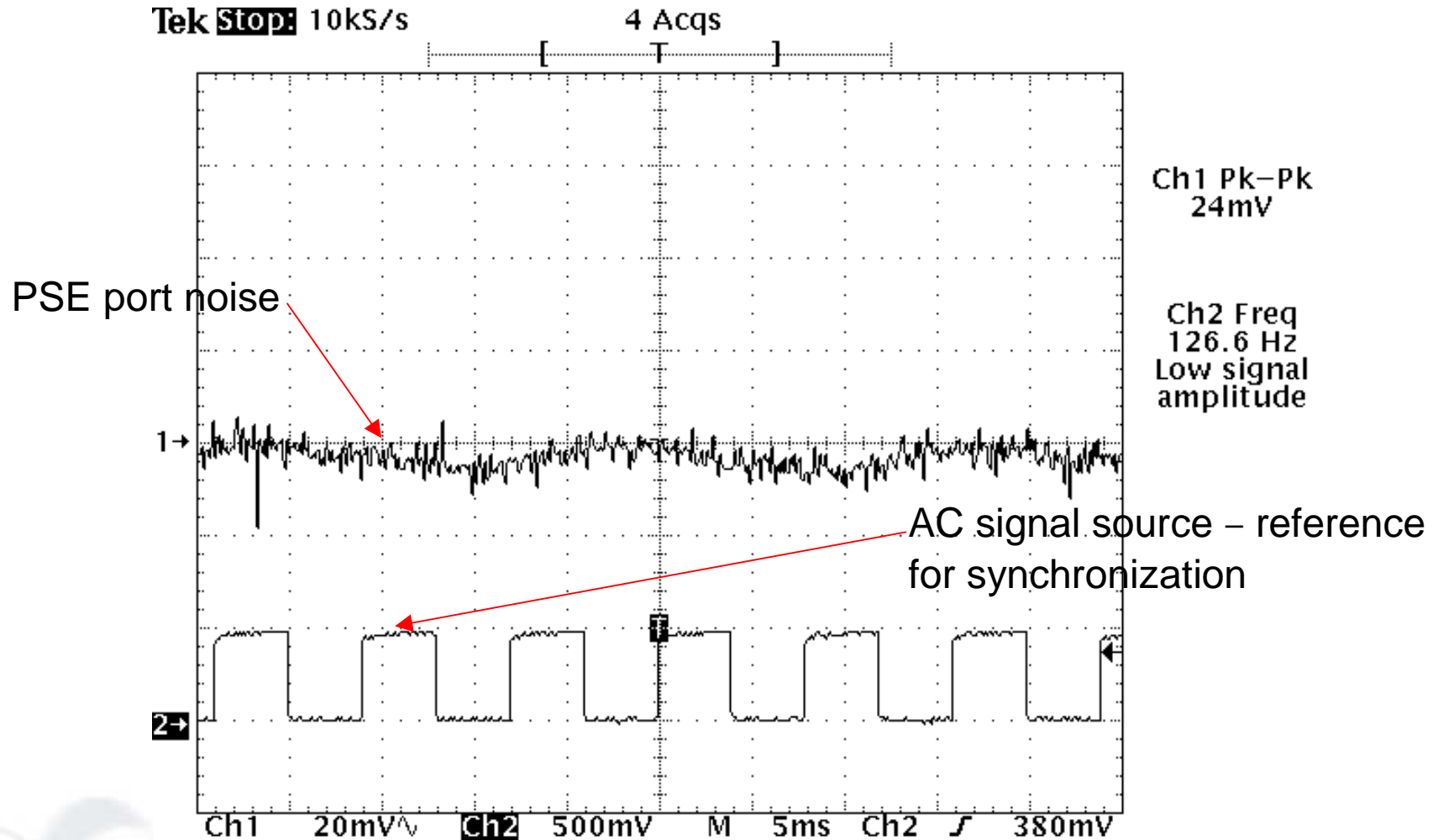
Test result – CAT 5, Fluorescent Lamp Ignitions



Test result – CAT 3, Fluorescent Lamp Ignitions



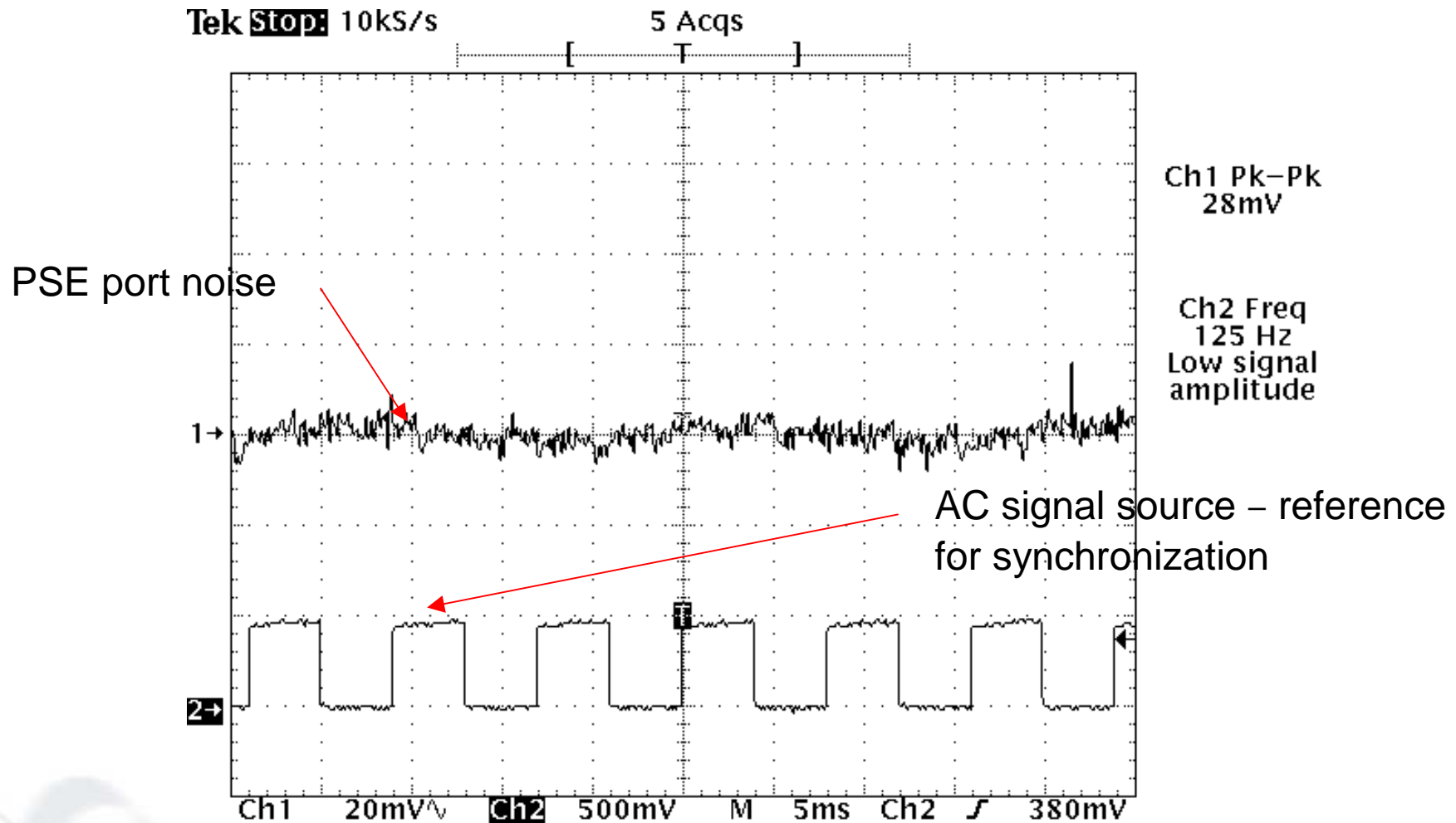
Test result – CAT 5, High Power Inductive load



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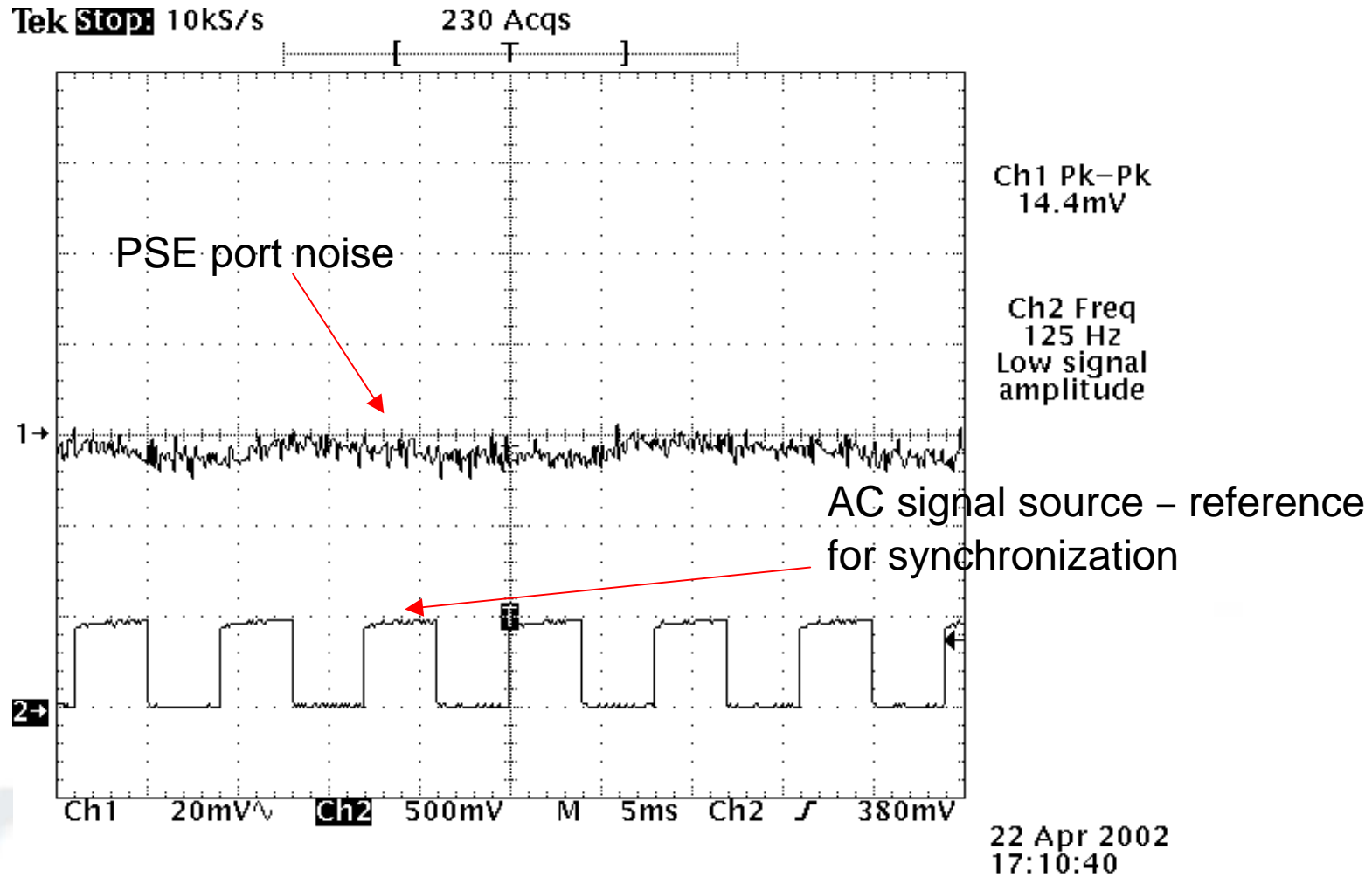
Test result – CAT 3, High Power Inductive load



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Test result–CAT 3, Ringing voltage, 30W/86Vrms/50Hz/70Hz



Summary and Conclusions

- With the suggested spec parameters:
 - Very low Sensitivity of Vac_close to low-frequency electrical field
 - Very low Sensitivity of Vac_close to Ringing voltages/Frequency
 - AC-Disconnect detection concept is not generating false disconnect detection

