



Schweizerische Eidgenossenschaft
Confédération suisse
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Federal Department of Justice and Police FDJP
Federal Office of Metrology METAS

TWSTFT at METAS Ch. Schlunegger





Menu

- ◆ Hardware modifications
- ◆ Data acquisition enhanced
- ◆ Influence of UTC(CH) on TWSTFT calculations
- ◆ Calibration with portable earth station
- ◆ Summary and outlook



Hardware Modifications

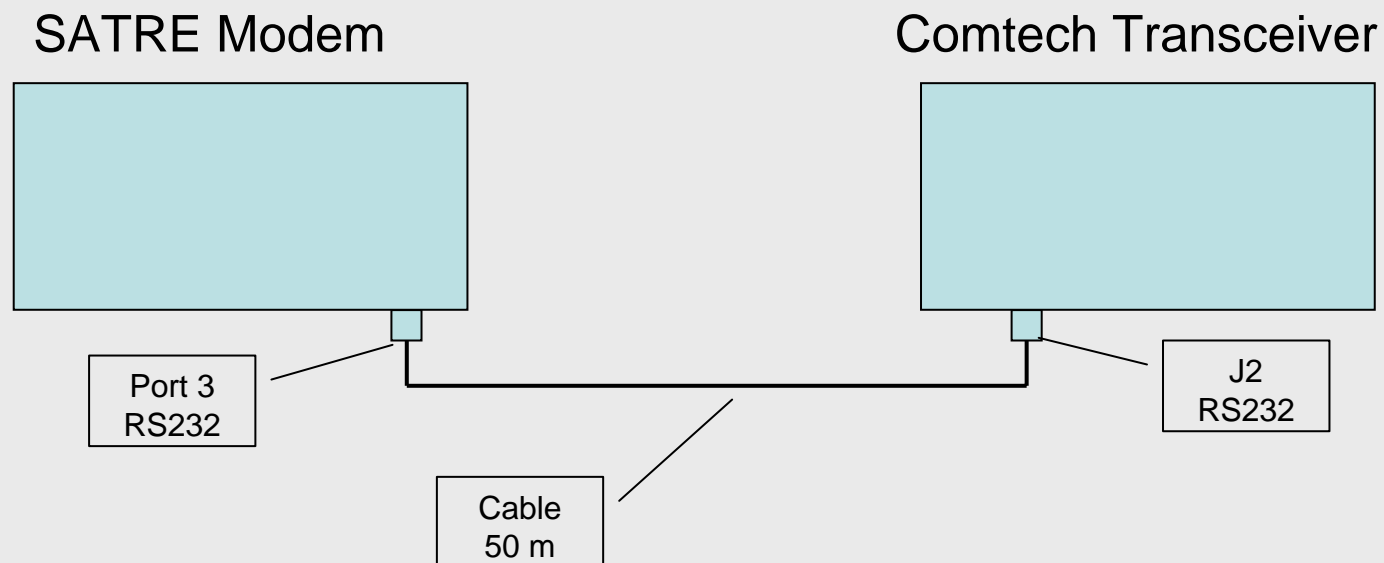
- Error message on SATRE Modem:
G/S Com Error



Hardware Modifications

→ Error message on SATRE Modem:
G/S Com Error

Before:

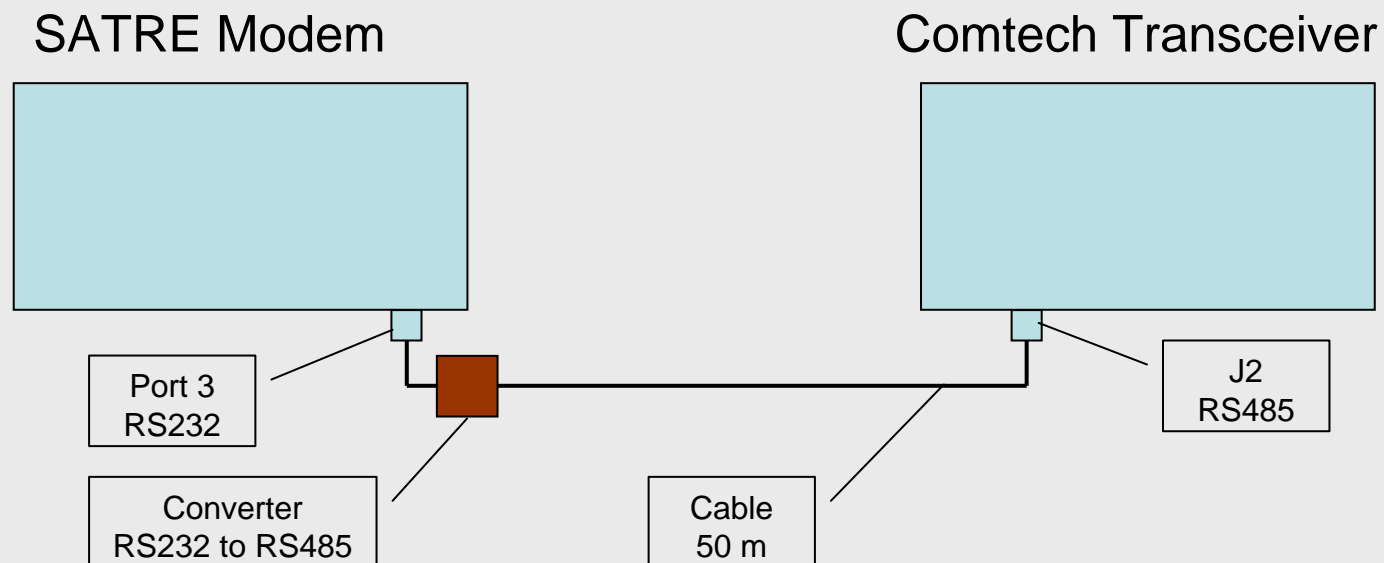




Hardware Modifications

Serial communication between SATRE Modem and Transceiver KST-2000A changed to RS485

Afterwards:





Hardware Modifications

- ◆ Environmental sensors installed

Upon the tower



- Temperature
- Humidity
- Wind direction
- Wind strength

On the transmitter



- Temperature

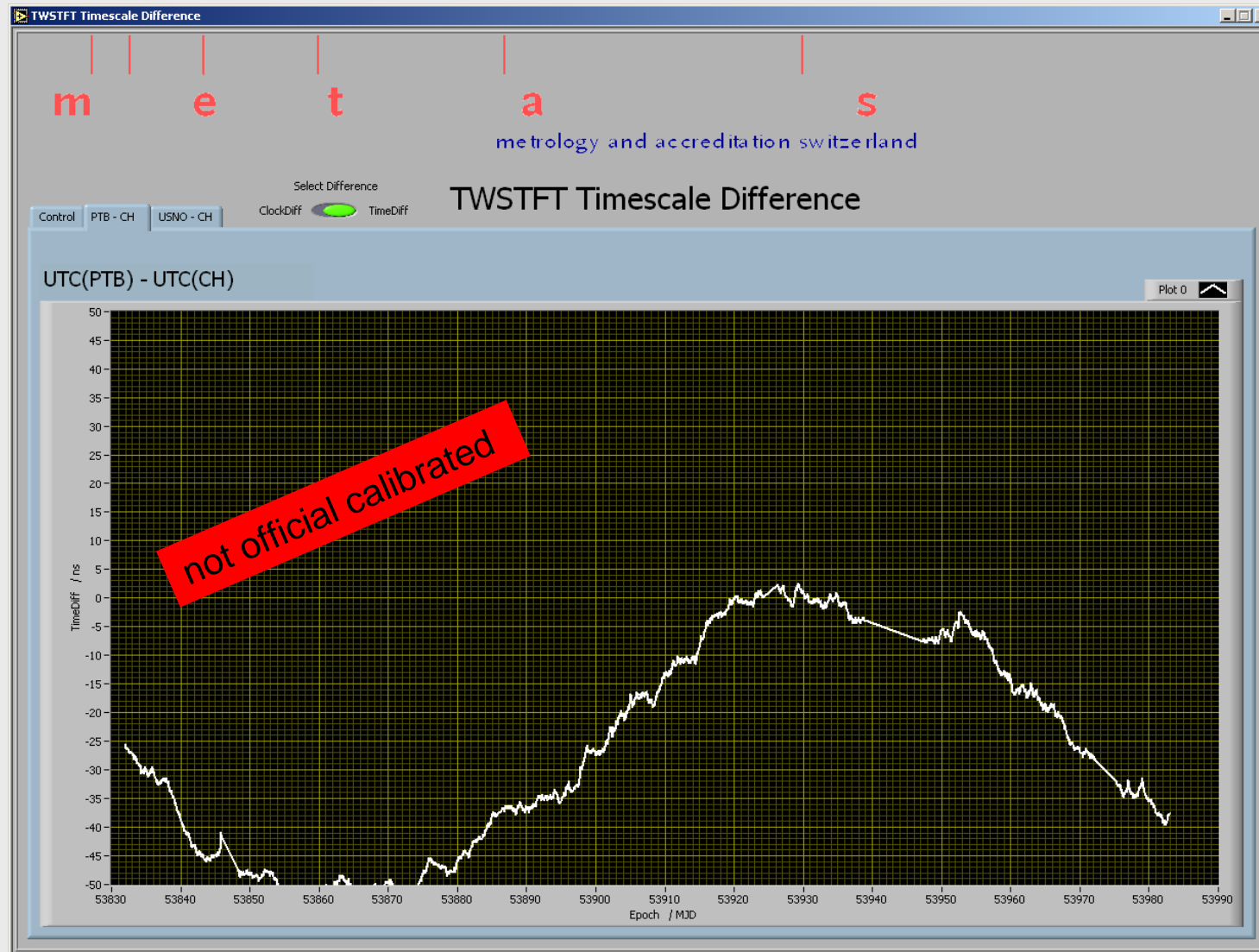
Close to the converter



- Temperature
- Humidity

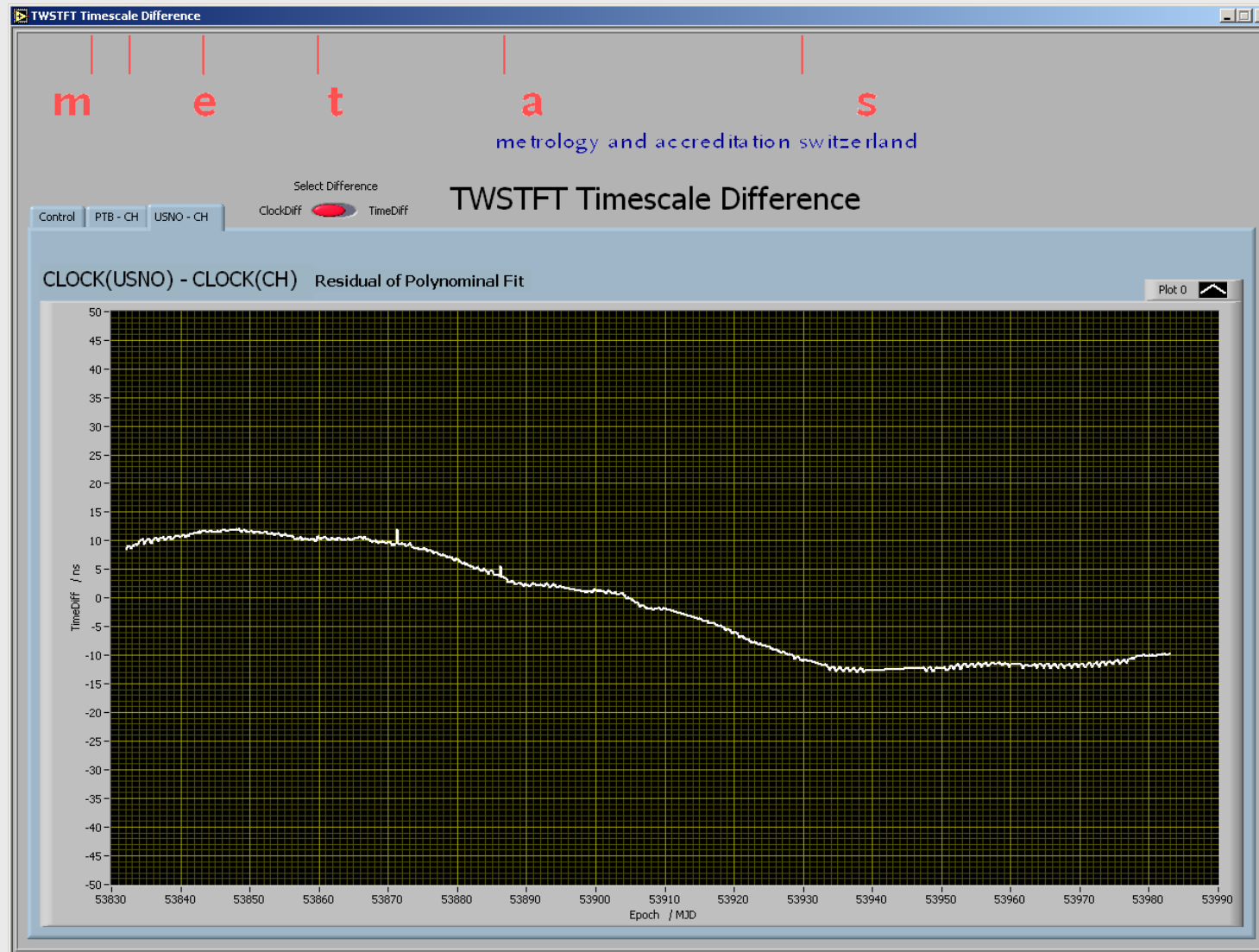


Autom. Link Calculation Implemented





Autom. Link Calculation Implemented





Characteristics of UTC(CH)

- ◆ As for now UTC(CH) is a paper clock
- ◆ UTC(CH) exists only at 00:00 UTC each day
- ◆ As reference clock for TWSTFT measurements a free running H-Maser is used
- ◆ The delay [UTC(CH)-Clock], published in the ITU data files, is interpolated

```

* n5380000.07n
* UTC(CH) - CLOCK = +0.000000122255 53800 000800
* CLOCK - 1PPSREF = +0.000000050270 53251 075100
* 1PPSREF - 1PPSTX = +0.000000716392 53800 000800
* DATA = 1PPSTX - 1PPSRX
53800 000700 0.269959145482
53800 000701 0.269959149835
53800 000702 0.269959154195
:      :      :

```

ATL	REFDELAY	RSIG
s	s	ns
119	0.000000888917	9.999
119	0.000000888240	9.999
119	0.000000887609	9.999
119	0.000000887364	9.999
111	0.000000886918	9.999
119	0.000000886758	9.999
.	.	.
.	.	.



Calibration with Portable Earth Station

Calibration performed from 26 May to 9 June 2006
together with:

PTB01: Physikalisch-Technische Bundesanstalt
Braunschweig, Germany

TUG01: Joanneum Research GmbH
Graz, Austria

CH01: Federal Office of Metrology METAS
Bern-Wabern, Switzerland



Summary and Outlook

- ◆ Environmental sensors installed
- ◆ Software for automatic link calculations developed
- ◆ Calibration of METAS TWSTFT performed

- ◆ Make use of the measured calibration results
- ◆ Implement UTC(CH) as physical timescale