

IEC TC38 - Instrument Transformers

Status report

IT4PQ Stakeholder meeting - February 2022



**Volker Leitloff (FR)
TC 38 chair**

volker.leitloff@rte-france.com



TC 38 Officers and Working Bodies

Secretary: Filippo Frugoni (IT)
Chair: Volker Leitloff (FR) Term 2017-08 – 2023-07
Vice-chair Olga Petrova (RU) - terminology

IEC Officer: Miroslav Siket

Members: 46 Members (26 P + 20 O)

Active WG/MT/PT

- CAG
- **3** MT, **10** WG (including 3 JWG),
- **5** PT (including 4 in WG37)

Liaison: 15 IEC, 3 Type A, 3 WG level

Participation in ACTAD



TC 38 – Plenary Meetings

Nov 2009	Madrid	(ES)
Dec 2011	Prague	(CZ)
April 2013	Houston	(US)
Nov 2014	Tokyo	(JP)
Nov 2016	Milano	(IT)
Nov 2018	Frankfurt	(DE)

Plenary 2020 planned in Bucharest cancelled due to COVID-19 crisis

Sept 21 web

2023 – to be scheduled

<http://www.iec.ch/>

<http://collaborate.iec.ch>



TC 38 - Scope

Standardisation in the field of AC and/or DC current and/or voltage instrument transformers, including their subparts like (but not limited to) sensing devices, signal treatment, data conversion and analog or digital interfacing.

Motivation for TC38 scope update in 2009:

- **cover all the emerging technologies**
- **new scenarios for equipment with integrated functions**
- **tighter coordination with TC13, TC57, TC85 and TC95**



Overview of TC 38 Standards

IEC 61869

- **Parts 1-99: General parts and parts related to HV applications**
- **Parts 100-199: Technical Reports**
- **Parts 200-299: LV Instrument Transformers**
[<1kV ac and <1,5kV dc]

IEC 62689

- **Fault Passage Indicators (FPI)**

IEC 63253

- **Station Service Voltage Transformers (SSVT)**



TC 38 - Overview of Standards

IEC 61869 Parts 1-5 “Conventional” IT

Reference	Title	Comment
61869-1	General Requirements	IS: 2007 MT48 Ed2 merge with -6 CD5 05/21 CDV T1 2022
61869-2	Additional Requirements for CT	IS: 2012 Ed2 MT 58
61869-3	Additional Requirements for Inductive VT	IS: 2012 Ed2 MT 58
61869-4	Additional Requirements for Combined IT	IS: 2013
61869-5	Additional Requirements for Capacitive VT	IS: 2012 Ed2 MT 58
61869-99	Glossary	WG 39 CDV 06/2021 FDIS T1 2022 Base for update of IEC 321





TC 38 - Overview of Standards

IEC 61869 Parts 6-13 Low Power IT

Reference	Title	Out	Comment
61869-6	Additional General Requirements for LPIT		IS: 2016 Ed2: merge -1
61869-7	Additional Requirements for Electronic VT	A/D	WG37 PT7/8 NP 02/20
61869-8	Additional Requirements for Electronic CT	A/D	WG37 PT7/8 CD1 06/21
61869-9	Digital Interface for IT	D	IS: 2016 WG37: AMD1
61869-10	Additional Requirements for LP Passive CT	A	IS: 2018
61869-11	Additional Requirements for LP Passive VT	A	IS: 2018 ISH Sept 21
61869-12	Add. Req. for Combined Electronic IT / LPIT	A	after 7, -8
61869-13	SAMU (Stand Alone Merging Unit)	D	IS: 2021

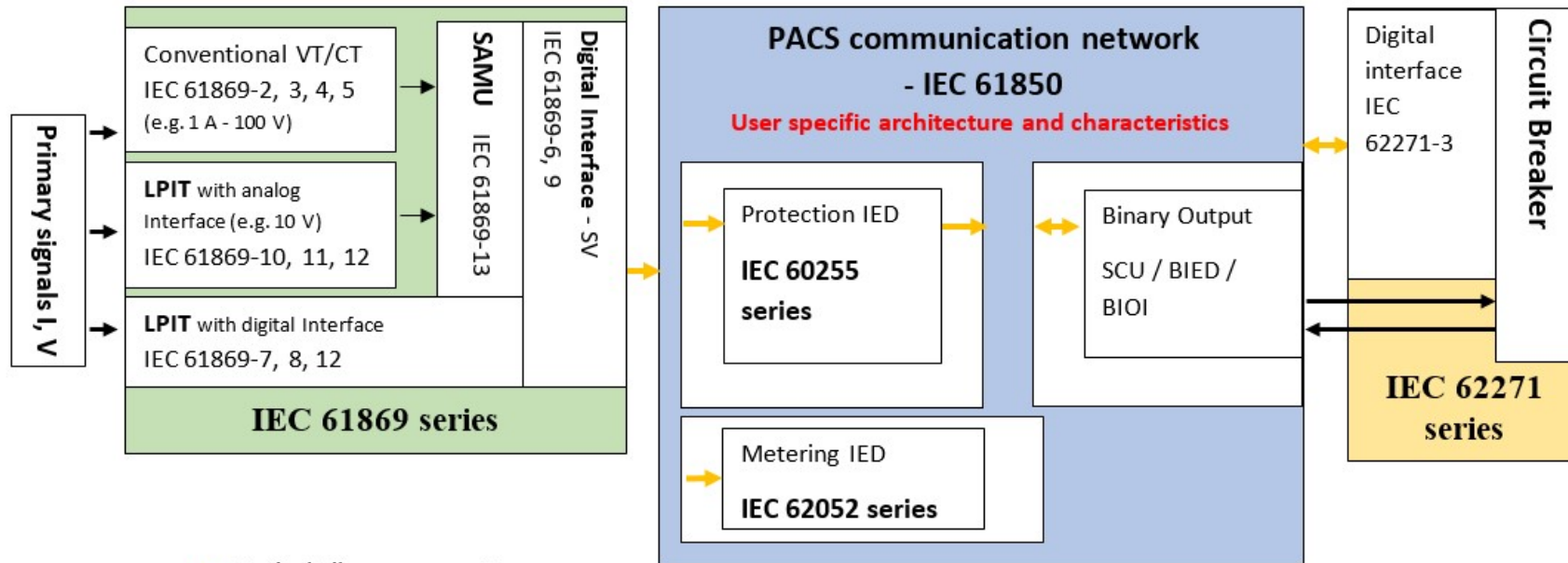


Notes: Parts -1, -and 16 also apply to LPIT

Part -9: update required for consistency with IEC 61850 ed 2.1



Functional Protection Chain



— Optical Fiber

— Co

Use Case	Error of primary IT	Error of analog acquisition	Error due to numeric processing in the protection function
	End-to-End error of the acquisition chain		
	End-to-End Error of the functional chain		
Conventional IT – IED with analog input	Covered by IEC 61869-2	Covered by IEC 60255-1xx series	
Conventional IT – SAMU – IED with digital input	IEC 61869- 3, -5	Covered by IEC 61869-6 IEC 61869-13	Presently covered by IED specification.
LPIT - IED with digital input	Covered by IEC 61869-6, and future IEC 61869-7 and -8		Will be covered by relevant standards (IEC 60255-1xx) associated to protection functions.



TC 38 - Overview of Standards

IEC 61869 Parts 14 /15 DC

Reference	Title	Comment
61869-14	Add. Req. for CT for DC Applications	IS: 2018 Ed2 MT 59
61869-15	Add. Req. for VT for DC Applications	IS: 2018 Ed2 MT 59



IEC 61869 Parts 16- ?? IT Companion Standards

Reference	Title	Comment
61869-16	TEDS (Transducer Electronic Data Sheet) for IT	WG 37 PT16
61869-20	Product Safety Req. for IT above 1kV	WG 57
61869-?	IT integrated with other functions	WG 54





TC 38 - Overview of Standards


IEC 61869 Parts 2xx LV applications

Reference	Title	Comment
61869-201	General Req. for IT used in LV Applications	WG 49 CD1 11/2020
61869-202	Additional Requirements for inductive CT for LV applications	WG 49 CD1 11/2020
61869-210	Additional Requirements for LPCT for LV applications	WG 49 Split from part 202 proposed in 2020 CD1 11/2020
61869-220	Product Safety Requirements for IT used in LV Applications	JWG 52 CD1 CD1 02/2019



TC 38 - Overview of Standards

IEC 61869 Parts 100-199 Technical Reports

Reference	Title	Comment
61869-100	Guidance for application of CT in power system protection	TR:2017
61869-101	Standard Mathematical Models for Instrument Transformers	WG45
61869-102	Ferroresonance oscillations in substations with inductive VT	TR:2014
61869-103	Use of IT for power quality measurement	TR:2012
61869-104	Evolution of Instrument Transformers <i>ratings</i> for the modern market	WG47
61869-105	Uncertainty evaluation in the calibration of Instrument Transformers	WG55 CD1 06/2019 Double Logo
61869-106	Selection and interfacing of Instrument Transformers for wide bandwidth applications	PT 106 



TC 38 - Overview of Standards

IEC 62689 Fault Passage Indicators

Reference	Title	Comment
62689-1	Current and voltage sensors or detectors for FPI- Part 1: General principles and requirements	IS:2016
62689-2	Current and voltage sensors or detectors for FPI- Part 2: System aspects	IS:2016
62689-3	Communication	WG Disbanded in TC38 Plenary 2018
62689-4	Conformance Testing	

IEC 63253 SSVT

Reference	Title	Comment
63253	Station Service Voltage Transformers (SSVT)	JWG 56 CD3 06/2021 CDV T1 2022 Double Logo



Other Aspects and Events (1/4)

CAG - average 1 meeting /month (3h zoom) Scope

- Discuss and decide technical and organisational items not requiring NC votes
- Prepare decisions and proposals to submit to NC voting
- **Review and validate Responses to received comments**
[Review process has been improved to be more efficient]
- Review and supervision of WG/MT activity

ACTAD - Several subjects covered by ACTAD may have an impact on TC38 standards and work

ACEA : discussion about application of ACEA guide to TC38 standards. Issues for a straightforward application.



Other Aspects and Events (2/4)

Metrology – EMPIR - European Metrology Program for Innovation and Research (EMPIR)

- **IT4PQ: TC38 is main stakeholder.**
 - Kick-off meeting in September 2020, Stakeholder WS Feb21 and Feb22
 - Several presentations in different TC38 working bodies and WS associated to the Plenary 2021
- **Implication of TC38 in other EMPIR / EURAMET projects under discussion**

CIGRE SC A3

- **Discussion about possibilities of collaboration and synergies**
- **List of subjects of common interest dressed**
 - PMU and synchrophasor application
 - Protection applications
 - On-site accuracy tests
 - Impact of aging on IT
 - Travelling Waves



Other Aspects and Events (3/4)

TC 95

Common meeting TC38/TC95 planned in 2020, cancelled due to COVID crisis

- Common subjects
 - **Digital Interface** Instrument Transformers – protection functions
 - **Analog interface** Instrument Transformers – protection functions
 - Feedback to both TC for future development of IEC 61869 and IEC 60255 series

TC57

- Presentation of IEC 61850-1-2 (Guide for extension of IEC 61850) by Laurent Guise. Need to identify a **Model Manager** for TC38
- Evolutions introduced by IEC 61850-9-2 **ed. 2.1** require update of part -9
- Need for coordination to anticipate impact of evolutions in IEC 61850 on TC38 standards



Other Aspects and Events (4/4)

Passive LPIT

- After publication of IS, comments on part 11 from CZ on availability of test systems
- Impact of installation on LPIT accuracy: how to address this issue?
- Demand from DE to establish an interpretation sheet for tests of part 11. This task has been assigned to WG37/PT10-11-12
- ISH developed and published
[IEC 61869-11:2017/ISH1:2021](#)

Burden of TC

- enquiries how to interpret subclause 5.6.201.3 of IEC 61869-2 (power factor of burden < 5 VA)
- CAG TF2 charged to review comments and to prepare more consensual ISH version
- ISH developed and published
[IEC 61869-2:2012/ISH1:2022](#)



Collaboration IEC TC38 - CENELEC TC38

Standard	Subject	EMC	LV	CLC 38 WG
61869-13	SAMU	x	x	3
61869-16	TEDS	x		
61869-1	Common	x	x	1/2
61869-2	CT	-	?	
61869-3	VT	-	x	
61869-7	LPVT	x		1/2
61869-8	LPCT	x		1/2
61869-201	Common-LV	x	x	1/2
61869-202	LV CT		?	1/2
61869-210	LV LPCT	x	?	1/2
61869-220	LV Safety		x	1/2
63253	SSVT		x (?)	

CLC 38

Secretary: P. Mazza (IT)

Chair: V. Leitloff (FR)

WG

Aim: harmonization of IEC standards

- WG1 LV
- WG2 EMC
- WG3 EN 61869-13

Close collaboration between CENELEC TC38 and IEC TC38 to be implemented



Work to finish or start

- **Move forward planned TC38 standards and reports**
 - LPIT, part 1, Glossary, LV IT, TEDS, Uncertainty, TC Models, SSVT, Use of IT for quality
 - Safety, interfacing of Instrument Transformers for wide bandwidth applications
- **Start review on some standards of IEC 61869 series**
 - parts 2 - 5 after publication of IEC 61869-1 ed2
 - part 9 amendment after publication of IEC 61850 ed. 2.1
 - Parts 14-15
- **Work items under evaluation by WG47**
 - Accuracy versus Influencing Quantities
 - Travelling Waves
 - Use of Instrument Transformers for Power Quality measurement
 - Phasor Measuring Unit (PMU) - Synchrophasor applications
 - Questionnaire about Instrument Transformer Ratings
- **Implication in several EURAMET projects**
 - Metrology UHV – finalised in 2019, results of traceability of TOV used for part-1 ed2
 - IT4PQ [TC 38 is main stakeholder] : launched in 2020, close collaboration
- **Harmonisation of TC38 standards in cooperation with CLC38**
[LPIT, part 1, part 13, LV IT]



Conclusion

Huge Work performed since TC38 Plenary meeting 2018

- Part 13 published
- For several standards of TC 38: CD and CDV
 - Review of comments
 - Update of documents

...but COVID crisis, lack of resources and time has slowed down the work of some TC38 working bodies.

Thanks to..

- Filippo for his implication and support
- TC38 CAG for the support and availability
- TC38 experts for the efforts provided for the different working bodies

1906 Awards sponsored by TC38

- 2018 Pierre-André MONFILS BE
- 2019 Joachim SCHMID CH
- 2021 Veselin SKENDZIC US