INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

IEC TC38 - Instrument Transformers

ADMIT Stakeholder Meeting
June 2023

Volker Leitloff (FR)
Chair

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IEC TC 38 Officers and Working Bodies

Secretary: Filippo Frugoni (IT)
Chair: Volker Leitloff (FR) Term 2017-08 – 2026-07
Vice-chair Olga Petrova (RU) - terminology

IEC Officer: Miroslav Siket

Members: 47 Members (27 P + 20 O)

- Saudia Arabia added as P-member (june 22)

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

IEC 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	
Oct 23	**Bucharest**	**(RU)**

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 wit **IS 06-2023** NEW
61869-2	Additional Requirements for CT	**IS: 2012** Ed2 MT 58 NEW
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 NEW
61869-99	Glossary	WG 39 **IS 2022** Base for update of IEV 321

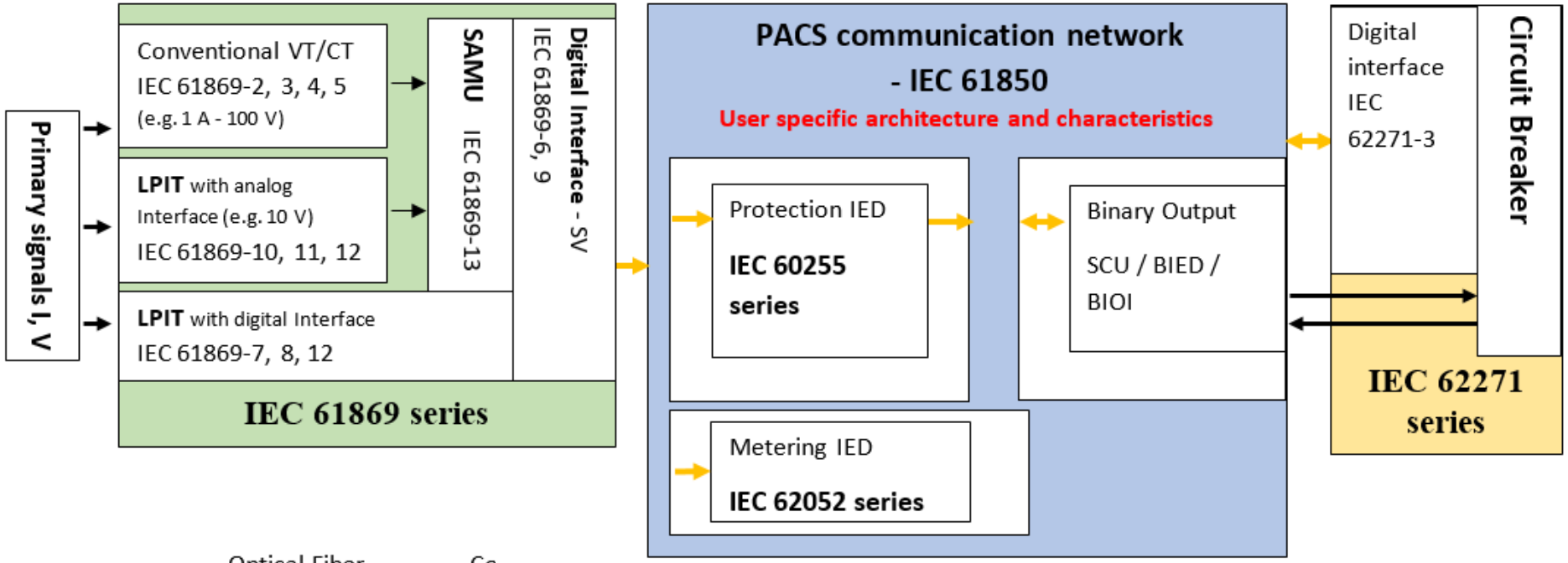
TC 38 - Overview of Standards

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 NEW
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 or Measurement Chain



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 IEC 61869- 3, -5	Covered by IEC 60255-1xx series	
Conventional IT –SAMU – IED with digital input		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

NEW

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
61869-21	Uncertainty evaluation in the calibration of Instrument Transformers	JWG 55 TR-> IS NP 03/23
61869-22	IT integrated with other functions	WG 54

NEW

NEW

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 *ratings* for the modern market	WG47
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 **FDIS** Double Logo

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

Harmonisation of TC38 standards in cooperation with CLC38

[LPIT, part 1, part 13, LV IT]

IEC TC38 – Ongoing and new work

- Move forward planed TC38 standards and reports
  - LPIT
  - LV IT
  - Uncertainty and influence quantities
  - TC Models
  - Use of IT for power quality measurments
  - TEDS
  - Safety
  - Interfacing of Instrument Transformers for
    - wide bandwidth applications (converters)
    - Travelling Waves

- Revision of 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 ed2 after thus
  - Part 14-15 DC

IEC TC38 – Ongoing and new work

- 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

Development of Technical Reports before introduction in IEC 61869 series

- 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
  - ADMIT [TC 38 is main stakeholder] : launched in 2023

Transfer of results to WGs and implementation in IS and TR

IEC TC38 & CLC TC38 – New challenges

- Green Deal : Include requirements and criteria in European Product Standards
  - Net Zero Industry Act (NZIA)
  - Critical Raw Materials Act (CRMA)
  - Ecodesign for Sustainable Product Regulation (ESPR)
- Deployment of converter based energy sources: impact on IT standards ?
  - Bandwidth
  - Environment (offshore)
- New Protection functions : impact on IT standards ?
  - DC: VSC, meshed grids, LV DC, offshore
  - Travelling Wave
- ACEA : Life Cycle Assessment for Instrument Transformers

ADMIT - IEC TC38 context

- Increasing use of Instrument Transformers for power system applications requiring an extended frequency range
- Topic not completely covered by existing standards. Missing items:
  - measurement methods
  - test procedures
  - instrumentation
  - uncertainty evaluation
- Applications:
  - Power Electronic Converter Control (RES)
  - related Power Quality measurements
- Testing, measurement procedures and uncertainty assessment covered by standardization for the LV measuring instruments

ADMIT - IEC TC38 context

Synthetic document submitted by IEC TC 38 to STAIR EMPIR secretariat in 2020summarizing the unaddressed standardisation needs :

1. **Definition of Instrument Transformer accuracy requirements and tests for the frequency range up to 150 kHz to be used for the development and extension of IEC 61869 standard series.**
2. **Investigation and definition of traceable calibration services for voltages and currents in this frequency range for Instrument Transformers with analog outputs.**
3. **Prospective results evaluating the possibility of extension of these aspects to higher frequency ranges.**