

## TC ANNUAL REPORTING FORM

### IMS Technical Committee

#### TC10, Waveform Generation, Measurement, and Analysis

#### Reporting period

Starting date (dd/mm/yy)	Ending date (dd/mm/yy)	Date of submission (dd/mm/yy)
01/10/21	31/12/22	05/05/23

#### Website

<http://tc10.ieee-ims.org/tc10-home>

#### Last update (mm/yy)

2022

#### TC Chair or co-Chairs

First Name	Second Name	Family Name	Affiliation /Address	Membership number	Phone	e-mail address	Date of election
Nicholas	G	Paulter, Jr	NIST 100 Bureau Dr. Gaithersburg, MD 20899 USA	41340692	240-483-5947 (c)	nicholas.paulter@nist.gov	2018

#### Secretary (check the right box)

Present ☐

Not Present ☒

First Name	Second Name	Family Name	Affiliation /Address	Membership number	Phone	e-mail address	Date of election
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#### TC Membership list<sup>(\*)</sup>

First Name	Second Name	Family Name	Affiliation /Address	Membership number	Phone	e-mail address	TC assignments (joining year)
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(AVAILABLE FROM IEEE)

\* Please add as many rows as needed

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TC mission – field of expertise (max. 1000 char. Including spaces)

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Develop, promote and support standards for specifying and measuring waveforms, and for specifying and testing instrumentation used for waveform measurement or generation;

Promote effective practices of waveform measurement, generation, and analysis through workshops, review papers, etc.;

Maintain liaison with other groups, societies, and standards organizations working in the same area.

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**TC meetings in the reporting period<sup>(\*)</sup>**

Date (dd/mm/yy)	Online / Face2Face	Attendance (number)	TC Members	Information sent within 4 months to (Yes/No)		
				Chair of TSAC	IM Magazine	Other (specify)
18 Jan 2022	on-line	21	see list in appended meeting minutes			
19 Apr 2022	on-line	18	see list in appended meeting minutes			
19 Jul 2022	on-line	19	unofficial meeting minutes not included			

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**Minutes of the yearly meeting (separate file)<sup>1</sup>:** meetings are held quarterly

**Participation in Society sponsored Events (Conferences, Symposia, Workshops)<sup>(\*)</sup>**

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<sup>1</sup> Yes/No, date of the yearly meeting;

<sup>\*</sup> Please add as many rows as needed

Name of the Event	Starting date (event) (dd/mm/yy)	Ending date (event) (dd/mm/yy)	Date Participation (dd/mm/yy)	Type of participation (Yes/No)			
				Sponsorship	Session	Tutorial	Other (specify) <sup>2</sup>

## Involvement in standard development<sup>(\*)</sup>

Standard	Working Group	Revision	Activity in the reporting period, including dates	Notes, attendance
Std 181	Pulse Tech	2011	No activity.	
Std 1057	Waveform recorder	2017	No activity	
Std 1241	ADC	2010	Completed revision.. Standard in ballot stage.. Monthly meetings until document finalized.	
Std 1681	DAC	2011	Completed revision. SStandard submitted torMEC. Meetings held every two weeks.	
Std 2414	Jitter	2020	Recently published – no activity..	
Std 1696	Probe standards	2021	Working group established in Jan 2022. Revision started in June 2022. One meeting held..	

## Participation in the development of Society Educational Programs<sup>(\*)</sup>

Program name	Involvement of chapters and sections	Activity in the reporting period, including dates	Notes, attendance
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## Other Activities (tutorials, teaching, career, cooperation, publications, joint activity with chapters or sections) <sup>(\*)</sup>

Type of activity	Starting date (dd/mm/yy)	Ending date (dd/mm/yy)	Activity in the reporting period	Notes, attendance
rafted and submitted article updating TC10 activities				

<sup>2</sup> For example, Involvement in reviewing papers (and indicate approximate number of paper reviews for the listed event)

\* Please add as many rows as needed

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**Recommended candidates<sup>(\*)</sup>**

Type (ADCOM, Fellow, Award –specify–)	First Name	Second Name	Family Name	Affiliation /Address	Motivation
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**TC operating Plan: near-term plans for the upcoming year, including scheduled meetings, activities, and so on (max. 1000 char. Including spaces)**

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- **Maintain valid membership list**
- **Hold periodic on-line TC10 WebEx meetings**
- **Maintain IEEE TC10 and IEEE SA web sites**

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**TC operating plan: long term vision from 2-5 years out, based on IMS Strategic Plan, including areas of strength , areas for improvement, how is the subject area going to change, planned actions for lifting achievement succession plans etc. (max. 1000 char. Including spaces)**

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- **Maintain current TC-10 membership and broaden industry involvement**
  - **Increase TC10 visibility, in collaboration with IEEE IMS and IEEE SA**
  - **Increase interest in participation as an officer**
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<sup>\*</sup> Please add as many rows as needed



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TC convergence, synergy, cooperation with other TC, from I&M or other societies (max. 1000 char. Including spaces)

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Comments/Suggestions (max. 1000 char. Including spaces)

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IEEE Waveform Generation Measurement and Analysis Technical Committee (TC10)  
Meeting Minutes

18 January 2022 / 11:00 AM –11:50 PM (EDT)

1. Call to Order
2. Introductions and Roll Call
  - a. Nick Paulter, TC10 chair, presided
  - b. Jerry Blair, TC10 Secretary, took minutes
3. Roberts Rules of Order Overview
4. Approval of the Agenda
  - a. Motion for agenda approval was provided and seconded. Agenda was approved unanimously.
  - b. The approved agenda is available on iMeetCentral (<https://ieee-sa.imeetcentral.com/login>).
5. Approval minutes from 21 June 2021 meeting
  - a. Motion for minutes approval was provided and seconded. Minutes were approved unanimously.
  - b. The approved minutes are available on iMeetCentral (<https://ieee-sa.imeetcentral.com/login>).
6. TC10 Policies and Procedures (P&P) Review
  - a. TC10 Standards Committee P&P - has been uploaded to the TC10 iMeetCentral site (<https://ieee-sa.imeetcentral.com/tc10-general/folder/WzIwLDEzOTIzMDEzXQ/WzIsNzk0MjA5NTRd/>).
  - b. Common Individual based WG P&P
    - i. The TC10 working group P&P has been approved and is available at the 1241 Working Group iMeetCentral site (<https://ieee-sa.imeetcentral.com/p1241/folder/WzIwLDE0NDM5MDA4XQ>).
7. Working Groups Updates
  - a. Revision of IEE Std 181, IEEE Standard for Transitions, Pulses, and Related Waveforms
    - i. Lead: Nick Paulter
    - ii. PAR expires 2025. We will wait until the 1241 is balloted and approved before starting on the 181.
  - b. Revision of IEEE Std 1241, IEEE Standard for Terminology and Test Methods for Analog-to-Digital Converters
    - i. Lead: Nick Paulter
    - ii. Making good progress: 1.5 clauses and 4 or 5 annexes to go. Text is expected to be finished by the next TC-10 meeting.
  - c. Revision of IEEE Std 1658, IEEE Standard for Terminology and Test Methods of Digital-to-Analog Converter Devices
    - i. Lead: Luca DeVito
    - ii. Not moving as fast as we would like. PAR ends at end of this year, may need an extension. Nick asked how many people are contributing, Luca said more than 10, and that people are contributing during the meeting but not much between meetings. Will consider increasing meeting frequency. Gregory said that the committee has increased

frequency of meetings. Alan Belcher pointed out that keeping track of how changes in one part of the doc affects other parts is the most difficult part.

- d. Revision of IEEE Std 1696, IEEE Standard for Terminology and Test Methods for Circuit Probes
    - i. Lead: John Jendzurski
    - ii. Kickoff meeting is scheduled for February.
  - e. IEEE Std 1057-2017, IEEE Standard for Digitizing Waveform Recorders
    - i. Lead: Bill Boyer
    - ii. Standard doesn't expire until 2028, so there is no need to start a revision process before 2026.
8. Future Meetings
- a. Frequency: meet once every three months. This will be a one-hour web-based meeting unless a majority of TC10 members request a face-to-face meeting. The content of these meetings will include general information, working group updates, related activities in other Standards Development Organizations, and guest technical presentation.
9. Discussion topics
- a. TC10 technical presentations: Nick asked if anyone would like to give a technical presentation for next meeting. David H will give a presentation. He will send Nick an abstract for distribution to the TC10 members.
  - b. Relationship between TC10 and other standards development organizations: Gregory asked about the relationship between TC10 and European committees. Nick pointed out that efforts in past to make common IEEE and IEC standards did not work out. Individual chairs have tried to harmonize the standards.
  - c. Out of date standards: Charles Cerny said that at a recent meeting it was pointed out that the relevant radar standards were out of date. He asked how to go about making the change. Nick recommended contacting the TC that authored the standard and informing them of the issue.
  - d. Other possible TC10 standards: Some discussion of WG standard. Gregory brought up Josephson based ADCs and DACs. Allan Belcher mentioned work on quantum ADCs. He pointed that IEEE standards are now in the IEC format so they could be more easily converted. He mentioned a test method he developed that was documented in an IEEE publication. He may give a presentation in the future.
10. Adjourn
- a. Motion to adjourn was made and seconded.
  - b. Meeting adjourned at 1154 (UTC-5).
11. Tasks
- a. Outstanding tasks (not completed from previous lists)
    - i. WG chairs - review web pages (<https://sagroups.ieee.org/im-wma-tc10/>) for content
  - b. New
    - i. Nick Paulter - upload draft minutes provide by Jerry Blair of 18 Jan 2022 meeting
    - ii. David Humphreys - provide presentation information (title, abstract, author brief) to Nick for distribution to TC10 members.
    - iii. Allan Belcher - send Nick information/presentation on quantum ADCs/DACs for distribution to TC10 members

Attendee list with affiliation:

Attendee name	Affiliation
Allan Belcher	Signal Conversion, Ltd, UK
Jerome Blair	Keystone International, Inc, USA
Fritz Capsers	CERN, Switzerland
Charles Cerny	USAF Research Laboratory, USA
Razvan Ciocan	Draper, USA
Paolo Croveti	Polytechnic University of Turin, Italy
Pasquale Daponte	University of Sannio, Italy
Luca De Vito	University of Sannio, Italy
Yuji Gendai	THine Electronics, Japan
John Jendzurski	National Institute of Standards and Technology, USA
Gregory Kyriaszis	National Institute of Metrology Standardization and Industrial Quality, Brazil
Alessandro Mingotti	University of Bologna, Italy
N Paulter	National Institute of Standards and Technology, USA
Sergio Rapuano	University of Sannio, Italy
Han Woong Yoo	Automation and Control Institute, Austria
Balázs Renczes	Budapest University, Hungary
Paolo Carbone	University of Perugia, Italy
Bill Boyer	Sandia Natl. Lab., retired, USA
Brian Lee	National Instruments, USA
David Humphreys	NPL, UK
Michael Cracraft	Rose-Hulman Institute of Technology, USA



IEEE Waveform Generation Measurement and Analysis Technical Committee (TC10)  
Meeting Minutes

19 April 2022 / 11:00 AM –13:00 PM (UTC-4)

1. Call to Order
2. Introductions and Roll Call
  - a. Nick Paulter, TC10 chair, presided
  - b. Jerry Blair, TC10 Secretary, took minutes
3. Roberts Rules of Order Overview
4. Approval of the Agenda
  - a. Motion for agenda approval was provided and seconded. Agenda was approved unanimously.
  - b. The approved agenda is available on iMeetCentral (<https://ieee-sa.imeetcentral.com/login>).
5. Approval minutes from 18 January 2022 meeting
  - a. Motion for minutes approval was provided and seconded. Minutes were approved unanimously.
  - b. The approved minutes are available on iMeetCentral (<https://ieee-sa.imeetcentral.com/login>).
6. TC10 administrative
  - a. Comments, concerns, issues for IEEE SA tools was solicited. No response.
7. Working Groups Updates
  - a. Revision of IEE Std 181, IEEE Standard for Transitions, Pulses, and Related Waveforms
    - i. Lead: Nick Paulter
    - ii. PAR expires 2025. We will wait until the 1241 is balloted and approved before starting on the 181.
  - b. Revision of IEEE Std 1241, IEEE Standard for Terminology and Test Methods for Analog-to-Digital Converters
    - i. Lead: Nick Paulter
    - ii. Making good progress: One annex and the abbreviations/symbols remain for completion. Text is expected to be finished by the next TC-10 meeting.
  - c. Revision of IEEE Std 1658, IEEE Standard for Terminology and Test Methods of Digital-to-Analog Converter Devices
    - i. Lead: Luca DeVito
    - ii. The frequency of the meetings has increased to twice a month, and significant progress is being made. Luca expects to be completed with the draft by the summer of 2022.
  - d. Revision of IEEE Std 1696, IEEE Standard for Terminology and Test Methods for Circuit Probes
    - i. Lead: John Jendzurski
    - ii. Kickoff meeting is scheduled for May 2022.
  - e. IEEE Std 1057-2017, IEEE Standard for Digitizing Waveform Recorders
    - i. Lead: Bill Boyer
    - ii. Standard doesn't expire until 2028, so there is no need to start a revision process before 2026.

## 8. Future Meetings

- a. Frequency: meet once every three months. This will be a one-hour web-based meeting unless a majority of TC10 members request a face-to-face meeting. The content of these meetings will include general information, working group updates, related activities in other Standards Development Organizations, and guest technical presentation.

## 9. Discussion topics

- a. TC10 technical presentations
  - i. David Humphreys provided a technical presentation, entitled “Overview of traceability and error sources for dynamic voltage measurement.” The presentation was followed by questions and discussion.
  - ii. Kruno Miličević, John Calvin, and Allan Belcher volunteered to provide a presentation. David Humphreys volunteered to provide another presentation in the future.
  - iii. Nick has asked Kruno to present at the next TC10 quarterly meeting.

## 10. Adjourn

- a. Motion to adjourn was made and seconded.
- b. Meeting adjourned around 1300 (UTC-4).

## 11. Tasks

- a. Outstanding tasks (not completed from previous lists)
  - i. WG chairs - review web pages (<https://sagroups.ieee.org/im-wma-tc10/>) for content
  - ii. Allan Belcher - send Nick information/presentation on quantum ADCs/DACs for distribution to TC10 members
- b. New
  - i. Nick Paulter - upload draft minutes provide by Jerry Blair of 19 Apr 2022 meeting
  - ii. Kruno Miličević - provide presentation information (title, abstract, author brief) to Nick for distribution to TC10 members.

Attendee list with affiliation:

Attendee name	Affiliation
Allan Belcher	Signal Conversion, Ltd, UK
Jerome Blair	Keystone International, Inc, USA
Bill Boyer	Sandia Natl. Lab., retired, USA
John Calvin	Keysight, USA
Paolo Carbone	University of Perugia, Italy
Fritz Caspers	CERN, Switzerland
Charles Cerny	USAF Research Laboratory, USA
Razvan Ciocan	Draper, USA
Luca De Vito	University of Sannio, Italy
Yuji Gendai	THine Electronics, Japan
Juan José González de la Rosa	University of Cadiz, Spain
David Humphreys	National Physical Laboratory (NPL), UK
John Jendzurski	National Institute of Standards and Technology, USA
Gregory Kyriazis	National Institute of Metrology, Quality and Technology (INMETRO), Brazil
Kruno Miličević	University of Osijek, Croatia
Alessandro Mingotti	University of Bologna, Italy
Nicholas Paulter	National Institute of Standards and Technology, USA
Balázs Renczes	Budapest University, Hungary

<b>TC 10 Member List</b>
Abhilasha Kawle
Alessandro Mingotti
Ali Hassan
Andrea Cataldo
Antonio Moschitta
Eulalia Balestrieri
Yeou Song Lee
Rujun Chen
Michael Cracraft
Pasquale Daponte
David Macii
William Boyer
Dennis Lia
Luca De Vito
Miguel Pereira
Dominico Carni
Dominique Dallet
Donald Larson
Charles Cerny
Egidio De Benedetto
Francisco Alegria
Francesco Lamonaca
Francesco De Paulis
Fritz Caspers
Grazia Iadarola
Gregory Kyriazis
Gearold O H Eidhin
Hans Yoo
Ioan Tudosa
Jerome Blair
John Jendzurski
John Calvin
Juan de la Rosa
Izzet Kale
Kevin Marquess
Kruno Milicevic
Fabio Leccese
Lorenzo Ciani
Marty Miller
Martin Hudlicka
Nicola Giaquinto
Paolo Carbone
Paolo Croveti
Nicholas Paulter
Pier Andrea Traverso
Allan Belcher

Raffaele Fiengo
Sergio Rapuano
Razvan Ciocan
Balázs Renczes
Steven Tilden
Soumyajyoti Maji
Yossi Ehrlichman
Xiaokang Yin
Han Woong Yoo
Yuji Gendai