

# Robotic Industries Association: Robot Standards

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Robotic Industries Association

# Robotic Industries Association (RIA)

## Today's Topics:

- About RIA
- About RIA's Standards
  - History
  - RIA's Foundational Standard: Safety Requirements for Industrial Robots and Robot Systems
  - Additional Standards Documents for Robot System Safety
- Definitions
- Resources



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# About RIA

- Founded in 1974
- Daughter organization of A3 – the Association for Advancing Automation
  - > 1,200 member companies
  - Largest automation trade group in North America, and number 2 in the world (second to only VDMA in Germany)
- Leader in robot standards development since 1982
  - ANSI, ISO primarily



# RIA's Role in Robot Standards

## RIA Standards Development Committee (SDC)

- RIA Members

### ANSI: R15, Robotics Standards in the U.S.

- *R15 Standards Approval Committee (SAC)*
- **R15.06** Drafting Subcommittee
- **R15.08** Drafting Subcommittee
- ANSI Committee members are *not* required to be RIA members

### U.S. Technical Advisory Group to ISO TC 299 ("U.S. TAG")

- Administers ANSI's membership in the ISO TC 299, Robotics
- U.S. TAG members are *not* required to be RIA members

### ISO Technical Committee 299, Robotics ("TC 299")

- **WG 1** – Vocabulary
- **WG 2** – Personal Care Safety
- **WG 3** – Industrial Safety
- **WG 4** – Service Robots
- **JWG 5 \*** – Medical Robot Safety
- **WG 6** – Modularity for Service Robots



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# About RIA's Robot Standards: Today

- R15.06-2012 > Direct U.S. Adoption of ISO 10218-2011. Safety requirements for industrial robots and robot systems.
  - RIA TR R15.306-2016. Task-based risk assessment.
  - RIA TR R15.406-2014. Safeguarding.
  - RIA TR R15.506-2014. Applicability for existing systems.
  - RIA TR R15.606-2016 > Direct U.S. Adoption of ISO/TS 15066:2016. Safety requirements for collaborative robots.
  - RIA TR R15.706-201X (In development). User Guidance.
  - RIA TR R15.806-2018. Test methods for PFL collaborative robot systems.
  - RIA TR R15.906-20XX (In development). Safety-related software.
- R15.08-20XX (In development). Safety requirements for industrial mobile robots



# About RIA's Robot Standards: History

Year	Standard Document
1986	ANSI/RIA R15.06-1986
1992	ANSI/RIA R15.06-1992
1999	ANSI/RIA R15.06-1999
~2000	ISO 10218 begun, based on R15.06-1999
2006	ISO 10218-1:2006
2007	ANSI/RIA ISO 10218-1:2017 & RIA TR to enable its use
2011	ISO 10218-1,2:2011
2012	ANSI/RIA R15.06-2012 (U.S. national adoption of 10218-1,2:2011)
2014	RIA TRs 306, 406, 506
2016	ISO/TS15066:2016; RIA TR R15.606-2016 (U.S. national adoption). TR 306 update.
2017	ISO/TR 20218-2:2017
2018	ISO/TR 20218-1:2018. RIA TR R15.806-2018.



# RIA's Foundational Standard



## ANSI/RIA R15.06-2012, Safety Requirements for Industrial Robots & Robot Systems

- U.S. National Adoption of ISO 10218-1,2:2011
  - 10218 Part 1: Safety Requirements for Industrial ROBOTS
  - 10218 Part 2: Safety Requirements for Industrial ROBOT SYSTEMS and Systems Integration



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- Resources



# RIA's Definitions

- **Question 1:** How does your group define terminology (e.g., ontologies, glossaries, something else)?
- **Question 2:** How do you define the following terms (as appropriate): robot, automated robot, teleoperated robot, environment, pose?
- **Question 3:** How did you determine these definitions (e.g., adopted from other standards, consensus among group members, something else)?



# RIA's Definitions

- **Question 1:** How does your group define terminology (e.g., ontologies, glossaries, something else)?
- **RIA response:** English language/ natural language consensus definitions
  - **For the Broader Industry:** RIA/ A3 actively participates in IFR's vocabulary efforts
  - **For Standards:** RIA's Standards definitions generally follow R15.06/10218, + ISO 8373 where applicable
- **RIA Standards:** English language/ natural language consensus definitions
  - Consult ISO 8373:2012, Robots and Robotic Devices - Vocabulary
  - Consult ISO 10218-1,2:2011, Robots and Robotic Devices - Industrial robots and robot systems – Safety requirements



# RIA's Standards Definitions

- **Question 2:** How do you define the following terms (as appropriate): robot, automated robot, teleoperated robot, environment, pose?

Term	Definition	Source
Robot	actuated mechanism programmable in two or more axes (4.3) with a degree of autonomy (2.2), moving within its environment, to perform intended tasks <i>[There are 2 Notes]</i>	ISO 8373:2012
<i>Industrial robot</i>	automatically controlled, reprogrammable (2.4), multipurpose (2.5) manipulator (2.1), programmable in three or more axes (4.3), which can be either fixed in place or mobile for use in industrial automation applications <i>[There are 4 Notes in the 10218 version]</i>	ISO 8373:2012; 10218-1,2:2011 (adapted)

# RIA's Standards Definitions

- **Question 2:** How do you define the following terms (as appropriate): robot, automated robot, teleoperated robot, environment, pose?

Term	Definition	Source
Automated robot	We do not use this term; in our general usage, all robots are “automated”; autonomy is a key part of our conception of a “robot”	
Teleoperated robot	We do not use this term; the closest related terms are “teleoperation” (8373) and “manual mode” (10218)	
Environment	We do not use this term; the closest related term is “normal operating conditions” (8373)	

# RIA's Standards Definitions

- **Question 2:** How do you define the following terms (as appropriate): robot, automated robot, teleoperated robot, environment, pose?

Term	Definition	Source
Pose	Combination of position and orientation in space <i>[There are 2 Notes]</i> <i>There are also a number of related terms, e.g., command pose, attained pose, path, trajectory</i>	ISO 8373:2012





# RIA's Standards Definitions

- **Question 3:** How did you determine these definitions (e.g., adopted from other standards, consensus among group members, something else)?
- **RIA Response:** Adopted from ISO 10218 and 8373; participated in the development of the natural language definitions in 10218 by consensus among group members, which then fed into the first version of 8373.



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# Resources: Robotics.org

The screenshot shows the Robotics.org website. At the top is a navigation bar with the RIA logo, 'ROBOTICS ONLINE', a search bar, and links for 'Sign In' and 'Register'. Below this is a dark blue menu bar with categories like 'RIA & YOU', 'ROBOTIC RESOURCES', 'UPCOMING EVENTS', 'WEBINARS', 'SAFETY & STANDARDS', 'INTEGRATOR CERTIFICATION', 'BECOME A MEMBER', and 'BLOG'. The main content area features a 'ROBOTICS ONLINE WEBINAR SERIES' banner with a 'REGISTER NOW' button. Below the banner is a large whitepaper download section for 'Collaborative Robotics End User Applications Whitepaper' with a 'Download this free whitepaper today!' button. To the right is a 'FEATURED PRODUCT' section for 'Honeywell Integrated Robotic Palletizing' with an image of a robotic arm. At the bottom of the whitepaper section are four red buttons: 'Collaborative Robots', 'Free Whitepaper', 'Free Webinar Series', and 'Subscribe to eNews'.

- Feature Articles
- Safety Resources
- Webinars
- Supplier Information
- Certified Integrators Program
- Industry Event Schedule
- More!



# Resources: Robotics.org/ Events

← → ↻ https://www.robotics.org/robotics/autonomous-mobile-robot-conference

Apps 01 - ISOTC eComm... Home - Robotic Ind... OSHA - RIA Work G... Home - A3 Associat... RIA - Robotics Onli... Easy scheduling | D... Other bookmarks

**ria** **ROBOTICS ONLINE**

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RIA & YOU ROBOTIC RESOURCES EMERGING MARKETS UPCOMING EVENTS WEBINARS SAFETY & STANDARDS INTEGRATOR CERTIFICATION BECOME A MEMBER BLOG

 **autonomous MOBILE ROBOT CONFERENCE**

**September 17, 2019**  
**Galt House | Louisville, KY**



← → ↻ https://www.robotics.org/collaborative-robots-advanced-vision-and-ai-conference

Apps 01 - ISOTC eComm... Home - Robotic Ind... OSHA - RIA Work G... Home - A3 Associat... RIA - Robotics Onli... Other bookmarks

 **COLLABORATIVE ROBOTS, ADVANCED VISION & AI CONFERENCE**

Presented By:   

**NOVEMBER 12-13, 2019**  
**DOUBLETREE BY HILTON SAN JOSE**  
**SAN JOSE, CA**

**Registration Coming Soon!**



← → ↻ https://www.robotics.org/international-robot-safety-conference

Apps 01 - ISOTC eComm... Home - Robotic Ind... OSHA - RIA Work G... Home - A3 Associat... RIA - Robotics Onli... Easy scheduling | D... Other bookmarks

**INTERNATIONAL RobotSafety CONFERENCE**

**OCTOBER 15-17, 2019**  
**JW MARRIOTT INDIANAPOLIS**  
**INDIANAPOLIS, IN**

 

 **REGISTER NOW!**

**VENUE & ACCOMMODATIONS** **BE A SPONSOR** **BE AN EXHIBITOR** **RETURN TO ROBOTICS' ONLINE HOMEPAGE**



# Resources: Robotics.org/ Safety Page

The screenshot shows the Robotics.org website's 'Safety Resources' page. The header includes the RIA logo, 'ROBOTICS ONLINE', and navigation links like 'Sign In' and 'Register'. A search bar and 'BROWSE BY' dropdown are also present. The main navigation bar lists categories: RIA & YOU, ROBOTIC RESOURCES, UPCOMING EVENTS, WEBINARS, SAFETY & STANDARDS, INTEGRATOR CERTIFICATION, BECOME A MEMBER, and BLOG. The 'SAFETY RESOURCES' section features three prominent cards: 1. 'ROBOT SAFETY STANDARDS DOCUMENTS' with a link to 'ANSI Standards and RIA Technical Reports' and a 'LEARN MORE' button. 2. 'ROBOT SAFETY TRAINING SEMINARS' with a description 'Join our experts at any of these upcoming training seminars!', sub-links for 'PUBLIC TRAINING OPPORTUNITIES' and 'IN-HOUSE SAFETY TRAINING', and a 'LEARN MORE' button. 3. 'SAFETY ESSENTIALS FOR COLLABORATIVE APPLICATION DESIGN' with a description 'Ensure that your workers are trained on the latest in collaborative application safety.' and a 'LEARN MORE' button. The background of the page shows a blurred image of a worker in a hard hat.

- Standards Documents
- Safety Seminars
- Webinars
- Risk Assessment Software





# Resources: Robotics.org/ Standards

The screenshot shows the Robotics.org website with the URL <https://www.robotics.org/robotic-standards>. The page features the RIA logo (Robotic Industries Association) and the Robotics Online logo. A navigation bar includes links for RIA & YOU, ROBOTIC RESOURCES, UPCOMING EVENTS, WEBINARS, SAFETY & STANDARDS, INTEGRATOR CERTIFICATION, BECOME A MEMBER, and BLOG. The main content area is titled "GLOBAL ROBOTIC STANDARDS" and includes two red buttons: "Subscribe to our Standards Newsletter" and "View the Newsletter Archives". A sidebar on the right titled "What Are Standards?" defines an industry consensus standard and lists its characteristics. A bottom section titled "Participate in a Committee!" describes the RIA's role in developing ANSI and ISO standards. Another section titled "Upcoming Standards Meetings" lists meetings scheduled for 2017 with a "View Meetings" button. A final section titled "Why Standards?" states that voluntary standards are important and beneficial.

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## GLOBAL ROBOTIC STANDARDS

[Subscribe to our Standards Newsletter](#) [View the Newsletter Archives](#)

### What Are Standards?

An Industry Consensus Standard...

- Provides normative and informative guidance
- Is typically developed through a consensus process
- Is drafted by a volunteer committee of representatives of concerned interests such as manufacturers, users, regulators, suppliers, integrators, consultants, and academia
- Provides a voluntary means to achieve a desired outcome
- Can become law when adopted by a regulatory agency

### Participate in a Committee!

The Robotic Industries Association sponsors development of ANSI and ISO standards applicable to the robotic industry. Drafting committees are formed for various topics of interest. Participation is open to "anyone with a direct and material interest" in the work being done. Participation is divided into Voting and Associate memberships. Voting members representing companies must have the

### Upcoming Standards Meetings

A list of all known robotics standards meetings scheduled for 2017.

[View Meetings](#)

### Why Standards?

Voluntary standards are important and beneficial to the industry. They provide a common language

- Standards Newsletter
- Upcoming Standards Meetings Schedule
- Committee Application

# Questions About Standards?



Robotic Industries Association

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