

RIA TR R15.106-2006

# technical report

*for Industrial Robots and Robot Systems —  
Safety Requirements*

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## **Teaching Multiple Robots**

Registered with ANSI  
May 28, 2006



ROBOTIC INDUSTRIES ASSOCIATION  
P.O. BOX 3724  
ANN ARBOR MI 48106

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Technical Report  
for Industrial Robots and Robot Systems — Safety Requirements —  
**Teaching Multiple Robots**

Secretariat  
**Robotic Industries Association**

Registered May 28, 2006  
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## Foreword

The primary objective of this Technical Report is to enhance the safety of personnel using industrial robot systems by establishing recommendations for the teaching (programming) of manipulating industrial robots in situations where multiple robots are located in a common safeguarded space. A second objective is to provide additional guidance on the intent of the committee in regards selected clauses in the ANSI/RIA R15.06-1999 American National Standard for industrial robot safety.

The Robotic Industries Association Subcommittee R15.06 on Safety annually reviews the "state of the industry" in regards the safe use of Industrial Robots. The 1999 edition of the robot safety standard – ANSI/RIA R15.06 – is proving to be well accepted and widely used. The committee does not believe any major changes are needed at this time, but did identify topics that could be more thoroughly explained. Therefore, the committee decided to develop this Technical Report to better help the user in understanding safety requirements for industrial robots.

Industrial safety cannot be regulated by a book; it must be a conscious effort on the part of everyone associated with automation and in this case, manipulating robots. Personnel skills, training, and attitude (including corporate safety culture) are extremely important factors in any successful safety program. This Technical Report is intended to provide guidelines for the safe operation of industrial robots.

This Technical Report is supplemental to the American National Standard ANSI/RIA R15.06-1999, and is not itself a standard. Industry standards, including technical reports, are voluntary. The Robotic Industries Association makes no determination with respect to whether any robot, associated safety devices, manufacturer, or user is in compliance with published standards.

Publication of this Technical Report that has been registered with ANSI has been approved by the Accredited Standards Developer Robotic Industries Association of Ann Arbor, Michigan. This document is registered as a Technical Report according to the Procedures for the Registration of Technical Reports with ANSI. This document is not an American National Standard and the material contained herein is not normative in nature. Comments on the content of this document should be sent to:

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## Technical Report for Industrial Robots and Robot Systems – Safety Requirements –

# Teaching Multiple Robots

## 0 Introduction

The use of this technical report is supplemental to the ANSI/RIA R15.06-1999 and provides additional safety information relative to teaching (programming) multiple industrial robots in a common safeguarded space in an industrial setting.

Practical experience has identified topics that the standard did not address in a clear and distinct manner. The most notable is the safety of the teacher(s) when “touching up” or modifying the robot task program of more than one robot as an anticipated routine and repetitive task integral to the production operation. Because multiple solutions for this topic are possible, the committee identified the most common or efficient solutions to suggest as acceptable practices.

The subject of teaching is principally covered in ANSI/RIA R15.06-1999 clause 10.7.5. Reference to Annexes is to the annexes of this technical report.

This technical report is informative in nature, and is not, nor is it intended to be a standard. The use of the word syntax “shall” and “should” in a particular scenario indicates the importance placed on specific criteria or features to that scenario which may or may not be adopted by the user of the technical report.

## 1 Scope

The purpose of this technical report is to provide interpretation of certain provisions of ANSI/RIA R15.06-1999 and to present examples of current industry practices for teaching (programming) multiple industrial robots that share a common safeguarded space. This information is in addition to the requirements contained in ANSI/RIA R15.06-1999 and the committee considers the examples to comply with the safety standard.

This Technical Report is intended to be used in the planning and execution of the installed production operation stage of robot system implementation as described in ANSI/RIA R15.06-1999 clause 7.3. ANSI/RIA R15.06-1999 clause 13 should be referred to for additional information on procedures for initial robot installation, test, and start-up.

The recommended practices will cover multiple teachers:

- Teaching two or more robots without overlapping restricted space
- Teaching two or more robots with overlapping restricted space

Teaching multiple manipulators from one common teach pendant (synchronous robots) is not included in this report as it is a single teacher situation described in ANSI/RIA R15.06-1999 clause 10.7.

Interpretations of selected current clauses in ANSI/RIA R15.06-1999 are contained in Annex F.

This entire technical report is informative.