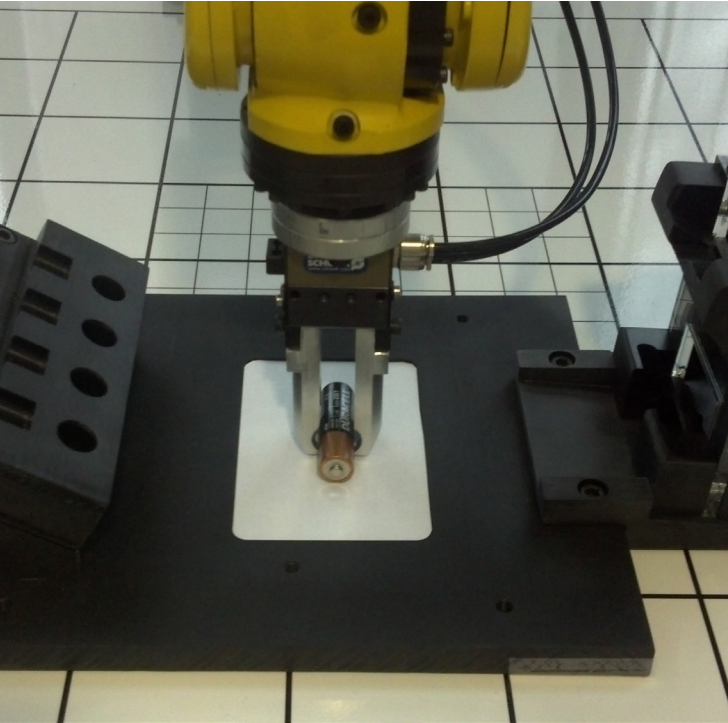


# Battery Package for Project Based Learning



### Basic Description:

FANUC Robotics Industry Certified Education Robot Training Program offers a Project Based Learning “Battery Package” designed to give students a practical application for learning machine vision concepts using FANUC *iRVision* Error Proofing (CERTVEP) and FANUC *iRVision* 2D Guidance (CERTV2D). FANUC Robotics *iRVision* Error Proofing is used in industry as a powerful, easy-to-use, and efficient solution to help maximize quality and production uptime by reducing scrap, rework, repair, warranty and other production losses due to manufacturing inconsistencies. *iRVision* Error Proofing uses geometric pattern matching to identify product, inspect features, validate process, determine presence/absence and check product orientation. *iRVision* Error Proofing determines a PASS or FAIL based on various image criteria established by the programmer. FANUC Robotics *iRVision* 2D Guidance builds upon vision concepts by teaching students how to use a taught image within a calibrated system to automatically adjust the programmed motion of the robot. *iRVision* 2D Guidance is used to locate the shift and rotation of the image in two dimensions. Once the location and rotation data is captured by *iRVision*, it is then used to modify the movement of the robot to accommodate for any changes.

### Course Objectives:

#### Basic *iRVision* with Error Proofing (CERTVEP)

- Understand *iRVision* Error Proofing and *iRVision* 2D Processes
- Hardware and Software Requirements
- Camera options and setup
- Establishing communications to the teaching PC
- Error Proofing setup, tools and functions
- Teach an Error Proofing vision process
- Check Battery Orientation (+/-)
- Vision commands and robot programming

#### Basic *iRVision* 2D (CERTV2D)

- Camera and Lighting Concepts
  - Digital Camera Types
  - Grayscale values, pixels, focal length, field of view and resolution
  - Color Contrast
  - Bright-Field Lighting and Dark-Field Lighting
- *iRVision* System Setup and Programming
  - Frames
  - Calibration
  - Single view vision process setup
  - Vision commands and robot programming

### Includes:

- Gripper Fingers for LR Mate – (No change required for M-1iA)
- “AA” Battery Magazine
- Loading Tray for Vertical, Horizontal, and Diagonal Load and Unload
- (1) Textbook: Basic *iRVision* with Error Proofing (P/N: CERTVEP)
- (1) Textbook: Basic *iRVision* 2D (P/N: CERTV2D)
- Optional: Student Textbook Package

### Requirements:

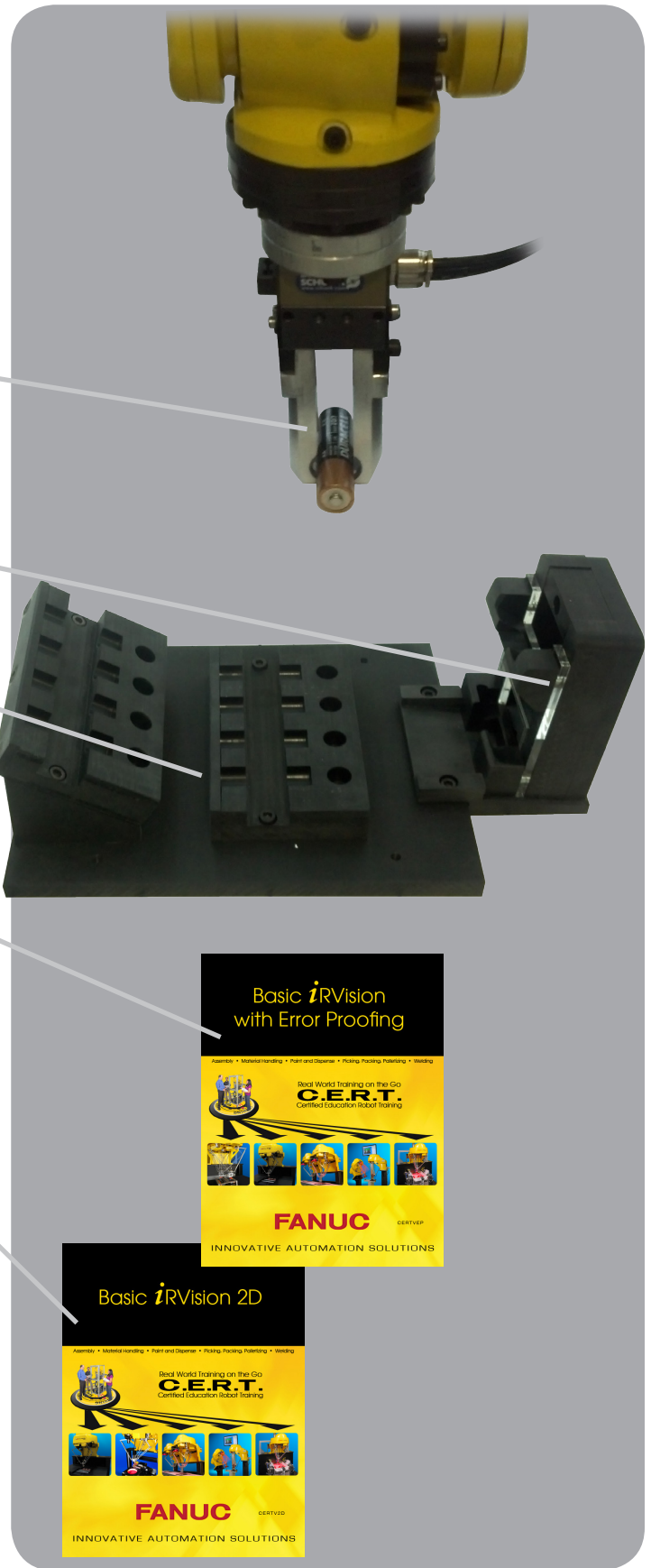
- *iRVision* 2D Guidance Hardware & Software
- *iRVision* CERT Program – Instructor Training
  - *iRVision* Setup & Operations – 2D Web Course
  - Attend *iRVision* Setup & Ops – 2D Course at FANUC America location

### Prerequisites:

- Instructor:
  - Material Handling CERT Training (MH-CERT)
- Students:
  - Basic Robot Operations
  - Basic HandlingTool Operations and Programming

## Includes:

- Gripper fingers for LR Mate (no change required for M-1iA)
- “AA” Battery Magazine
- Loading Tray for Vertical, Horizontal and Diagonal Load and Unload
- (1) Textbook: Basic *iR*Vision with error proofing (P/N: CERTVEP)
- (1) Textbook: Basic *iR*Vision 2D (P/N: CERTV2D)
- Optional: Student Textbook Package



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