

Manual Table of Contents

Category	Location	Description
Electrical	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/High%20Level%20System%20Overviews.pptx	A simple explanation of the voltage and control flow through the three primary electrical systems. Indicates expected outputs and limits of output when applicable.
Electrical	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Electrical%20Manual.docx	Electrical Manual - Explanation of electrical systems as a general overview. More detailed information in Power, Wireless, and Controls categories below. Larger images of electrical box located in Electrical folder and listed in Controls section below.
Mechanical	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Mechanical/Mechanical%20Overview.docx	Mechanical Manual – Explanation of mechanical systems as a general overview. More detailed information in Steering and Braking categories below.
Tutorial	http://youtu.be/eRTZySv6M-c https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Tutorials/Full%20Startup.mp4	Startup sequence – Video of how to start up the cart for remote control use. Followed by the calibration sequence below.
Tutorial	http://youtu.be/u_qVFBhd7N0 https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Tutorials/CalibrationSequence.mp4	Calibration sequence – Video of how to calibrate remote controller for use in moving and controlling the cart when starting it up.
Tutorial	https://youtu.be/Qq746MVnUgU https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Tutorials/EmergencyStops.mp4	Emergency stops – Locations of emergency stop functions on cart.
Clerical	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Clerical/Budget.xlsx	Budget – Items purchased for the cart by cost. Tracking of remaining funds, and categories funds were allotted to.
Clerical	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Clerical/Master%20BOM.xlsx	Build of Materials – Components purchased for the cart by name. Sorted by category with reference links where applicable.

Clerical	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Clerical/Custom Requirements.xlsx	3-Year Plan – Customer Needs as related to a 3-year scope for full project completion, listed by which phase is to complete each objective.
Clerical	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Clerical/Functional Decomposition.pdf	Functional Decomposition – Functional operation of ideal cart for Phase 1.
Stock Cart	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Stock%20Cart/G22AE%20Service%20Manual.pdf	Golf Cart service manual – Manual for servicing stock G22AE golf cart pre-modification.
Stock Cart	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Stock%20Cart/wiring%20diagram%20Yamaha%20G22E.pdf	Golf Cart wiring – Diagram of stock wiring in golf cart and all electrical connections thereof.
Stock Cart	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Stock%20Cart/Stock%20Golf%20Cart%20Data%20Sheets	Golf Cart data sheets – All data sheets & assembly diagrams for stock cart components.
Steering	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Mechanical/Steering/Potentiometer_mw22b.pdf	Potentiometer – Dimensions & specifications. Potentiometer is located under the dashboard attached to the steering column.
Steering	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Mechanical/Steering/Wicked%20EPS%20Installation%20Manual.pdf	Wicked system – Installation manual. “Wicked” power steering system is located under the “front hood” on the cart frame.
Braking	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Mechanical/Braking/bracket.PDF	Mounting bracket – Mounts braking actuator. Located at “base” of actuator, connecting it to cart frame.
Braking	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Mechanical/Braking/Electrak_150_Installation_Manual.pdf	Braking actuator – Installation manual. Actuator is located under the “front hood” behind the braking pedal.
Power	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Power/Power_System_Schematic.pdf	Power System – Map of power connections in the cart. Shows connections between cart batteries, 12V battery, and output for power.
Power	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Power/12V_12.5A_Supply_vhk150w.pdf	12V Supply – Data sheet of 48V → 12V supply in power system.

Power	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Power/5V_6A_3.3V_5A_Supply_pyb20-u.pdf	5V/3.3V Supplies – Data sheet of 12V → 5V supply and 12V → 3.3V supply in power system.
Power	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Power/Power_Components_List.xlsx	Power Components – Detailed information on connectors and components used in power system.
Wireless	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Wireless/EM506_u_m.pdf	GPS – Module for providing GPS on cart.
Wireless	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Wireless/DX6i-Manual_EN.pdf	Controller – Manual for remote controller use and operation.
Controls	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/ElectricalBoxPicture.jpg	Electrical box picture – Larger image of electrical box (unlabeled) from Electrical Manual at top of Table of Contents.
Controls	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/ElectricalBoxPictureLabeled.jpg	Electrical box picture, labeled – Larger image of labeled electrical box from Electrical Manual at top of Table of Contents.
Controls	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Controls/Inputs_Outputs_OverallBoard.xlsx	Inputs/Outputs – All I/O connections for electrical signals and internal board connections in cart electronics box. Useful in conjunction with Overall PCB to see connections.
Controls	<p>Circuit (PDF) - https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Controls/OverallPCB_circuit.pdf</p> <p>PCB (PDF) - https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Controls/OverallPCB.pdf</p> <p>Eagle directory - https://edge.rit.edu/edge/P15241/public/CAD/OverallPCB</p>	<p>Cart PCB – Main PCB in electronics box. Provides power to three Arduino Dues which process control of the cart and handles analog needs for level shifting and signal handling.</p> <p>PDF files for easy viewing, plus link to full Eagle PCB and circuit layout files (viewable with Eagle software).</p>

Controls	<p>Circuit (PDF) - https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Controls/BigSignalBuff_circuit.pdf</p> <p>PCB (PDF) - https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Controls/BigSignalBuff.pdf</p> <p>Eagle directory - https://edge.rit.edu/edge/P15241/public/CAD/BigSignalBuff</p>	<p>Signal buffer board – Smaller PCB in electronics box. Provides level shifting and signal buffering.</p> <p>PDF files for easy viewing, plus link to full Eagle PCB and circuit layout files (viewable with Eagle software).</p>
Controls	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Controls/Wiring%20Breakdown.pdf	Wiring breakdown – Visual diagram of wiring connections from main PCB to connectors, and from connectors to output groups.
Controls	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Controls/FinalCode	Code – Final code used on Arduino Dues to operate the cart. Each sub-folder and file is named for what operation it performs on the cart.
Controls	https://edge.rit.edu/edge/P15241/public/Final%20Documents/Manual/Electrical/Controls/FinalCode/Final_Code.pdf	Code PDF – Final code copied in PDF form as a quick reference when other software to view it is unavailable.