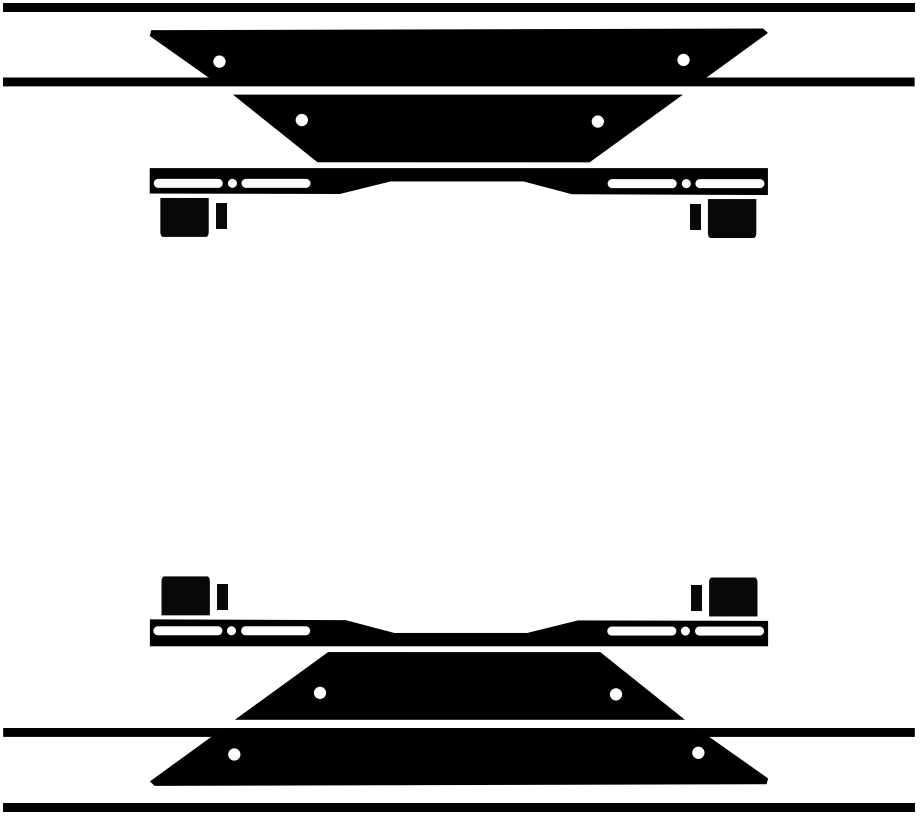
# SUMMIT ASCENT-r™



spireOS™

OPERATIONS MANUAL

# SUMMIT ASCENT-r™

## spireOS™

OPERATIONS MANUAL

Version 1.0 | Spire Ranges © 2026

Our customers are the heroes who make our world, countries, and communities safer. At Spire, we create exceptional shooting range systems that prepare them for when duty calls.

## OUR MISSION?

# EVERY HERO COMES HOME SAFE.

# CONTENTS





CONTENTS

## SUMMIT ASCENT-R INTRODUCTION

The Ascent-r is a is a motion-controlled, overhead, cable-driven target system that is ideal for any range's customized training programs and courses of fire. Targets can be controlled individually, or synchronized with a Spire master control touch screen and/or app.

The Ascent-r system is outdoor-rated and proven durable, making it an ideal target system for all types of facilities and organizations; including law enforcement, military, government, commercial, private ranges, and indoor/outdoor ranges.

## MASTER CONTROL CONSOLE OVERVIEW

The Master Control Console allows a range master to manually control drills for an individual position or for all of the positions simultaneously on the range. As an option, a phone app allows for the rangemaster to control the system from the firing line. Additionally, an optional wireless remote allows for the range master to control the system from the firing line.

## IMPORTANT SAFETY INFORMATION

Maintenance and use must adhere to the guidelines in this manual. Improper use of any of the equipment can result in poor performance, product damage and even serious physical injury. Properly trained personnel should only operate the equipment within the range. For technical, mechanical and electrical maintenance, it is recommended that a trained professional be consulted. Protective headwear, eyewear and gloves should always be worn when performing any maintenance. Danger risks include, but are not limited to, electric shock, head injuries, limb or body crushing, poking/pinching of extremities and eye trauma.

Operators should take care when operating clamps and be aware of location of any sharp locations. Spire is not liable for any injuries sustained while operating the clamps.



## WARRANTY OF EQUIPMENT

Refer to agreement documents for specific warranty details for your range. All Spire Ranges equipment is warranted against defects in materials or workmanship under normal use and service, with coverage periods varying by equipment type and range agreement. Warranty periods begin upon equipment handoff and completion of customer training and apply only to the original installation and purchaser.

Coverage excludes consumable items, normal wear and tear, misuse or abuse, improper maintenance, unauthorized modifications, non-approved materials, and damages caused by external factors, third-party systems, or alterations/repairs made by anyone who is not pre-authorized in writing by Spire Ranges to modify, alter, repair, or otherwise handle in any way the product. Damage resulting from the use of armor-piercing (AP) or tracer ammunition or calibers not approved for your range's ballistic rating, as well as excessive wear from high-velocity rounds exceeding 3000 fps, is not covered.

Spire Ranges reserves the right to determine if any part is defective and to repair or replace parts as it elects. This warranty does not cover shipping costs of defective parts from the owner's site. Customers are responsible for proper maintenance, maintaining service records, and timely reporting of issues. Return shipping to the site is covered by Spire Ranges during the warranty period. Warranty service is subject to compliance with required procedures, including remote troubleshooting prior to any authorized onsite service. This warranty covers on site labor, travel expenses and accommodations if applicable.

Damage of Spire Ranges equipment resulting in utilizing armor piercing (AP) ammunition or tracer rounds will not be covered under warranty. In addition, high velocity rounds (both ball and frangible) traveling at speeds more than 3000 fps may result in wear, dimpling and pocking of the 1/4" AR500 ballistic shields and target clamps depending on the angle of impact. Such wear, dimpling, and pocking under these conditions is not covered under warranty.

Spire Ranges provides lifetime phone and email support for troubleshooting and operational guidance. Extended warranties and service agreements are available separately.

## BALLISTIC RATINGS

Ammunition specs listed below are examples of energy and velocity only. Note, any use of Armor Piercing (AP), Steel Core, or Tracer Rounds will void the warranty.

| PLATE RATING | MUNITIONS TYPE | MAX ENERGY | MAX VELOCITY |
|---|---|---|---|
| 1/4" AR500 | Pistol | 1175 ft-lbs | 1485 fps |
| 3/8" AR500 | Pistol/Rifle | 3600 ft-lbs | 3300 fps |

| TYP. AMMO | BULLET WEIGHT | MAX ENERGY | MAX VELOCITY |
|---|---|---|---|
| .22 LR | 40 gr HP | 140 ft-lbs | 1400 fps |
| 9MM LUGER | 124 gr FMJ | 460 ft-lbs | 1293 fps |
| .357 MAG | 158 gr JSP | 663 ft-lbs | 1375 fps |
| .44 MAG | 240 gr SWC | 1175 ft-lbs | 1485 fps |
| 5.56X45MM NATO | 55 gr FMJ | 1402 ft-lbs | 3388 fps |
| 7.62X51MM NATO | 150 gr FMJ | 3048 ft-lbs | 3025 fps |
| .308 WIN | 150 gr SPTZ | 2800 ft-lbs | 2900 fps |
| 30-06 | 180 gr SPTZ | 3360 ft-lbs | 2900 fps |
| 300 WM | 190 gr BTHP | 3548 ft-lbs | 2900 fps |

Spire Ranges products can handle .50 BMG in moderation; however, due to the large amounts of energy exerted from the round, the following applies:

Repeatedly using .50 BMG will shorten the life expectancy of the product and may void warranty.

Repeated impacts of .50 BMG fired in the same location of the product can cause damage in as few as 50 rounds.

Any armor piercing (AP) rounds, particularly those from .50 BMG will void any warranty.



## LIMITATION OF LIABILITY

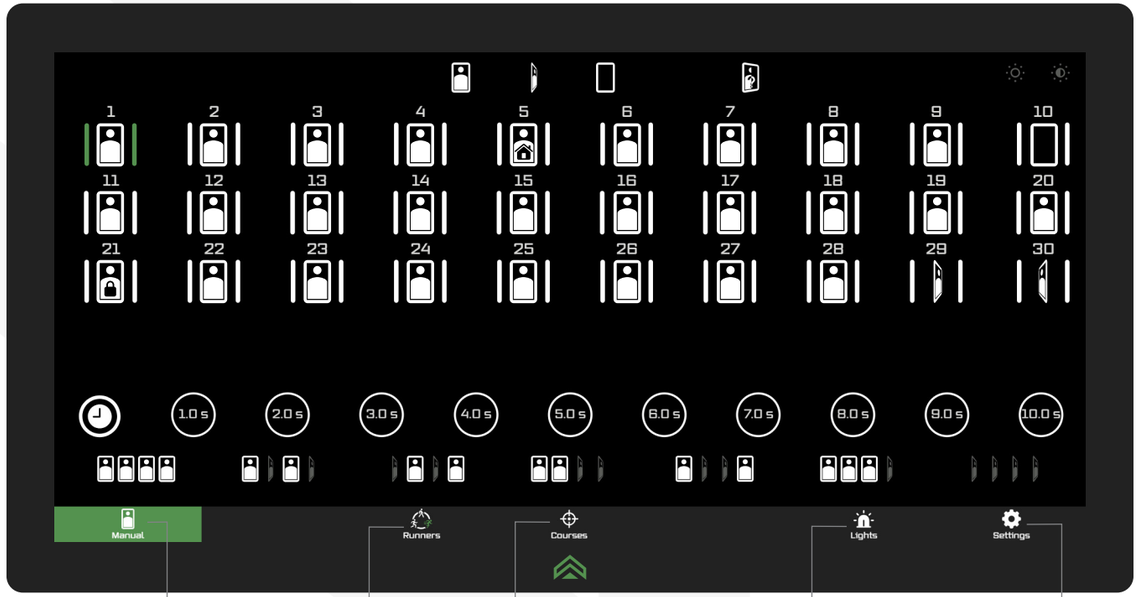
Neither Spire Ranges, nor any company affiliated with it, makes any warranties, representations or promise as to the performance or quality of the product other than what is specified in the original agreement between Spire Ranges and the range Owner. The liability of Spire Ranges to the Owner for damages arising out of the manufacture, sale, delivery, use of resale of this product shall be limited to and shall not exceed the cost of repair or replacement of defective parts. Spire Ranges shall not be liable for loss of use, inconvenience or any other incidental, indirect or consequential damages.

No representative of Spire Ranges has the authority to make any representation or promise on behalf of Spire Ranges or to alter or modify the terms or limitations of warranties in any way.

MASTER CONTROLS:

# NAVIGATION






Turner Manual Operation Screen

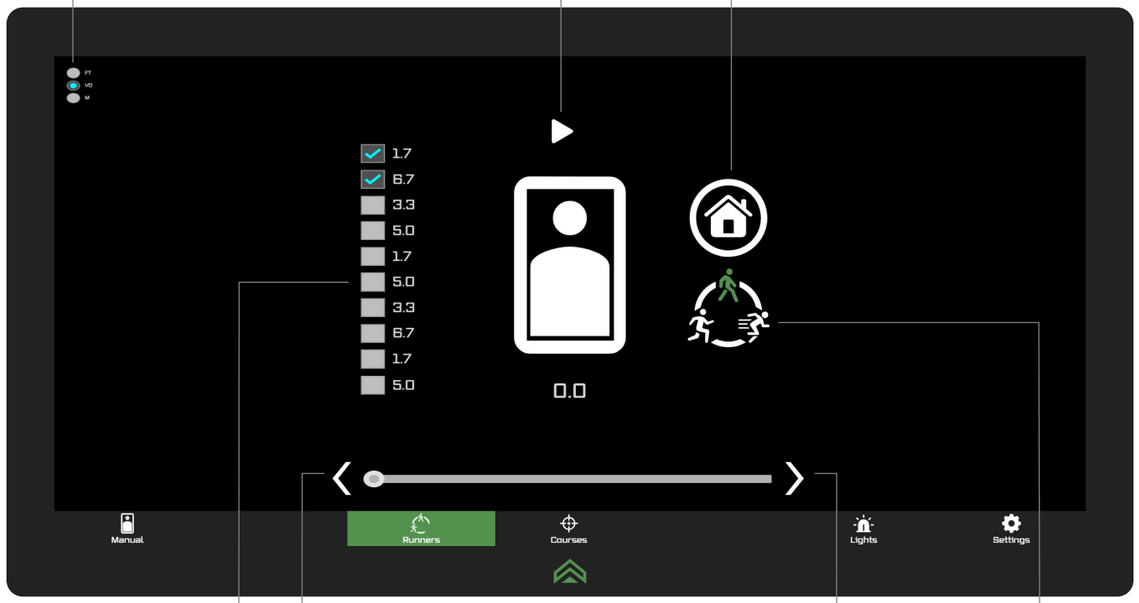
Running Man Operation
p. 18

Courses of Fire Menu

Yard Line Lights
*(optional)*

Settings
p. 21

MANUAL SESSION


Distance Unit of Measure Selection
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Play/Pause Movement
Home Target
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1.7
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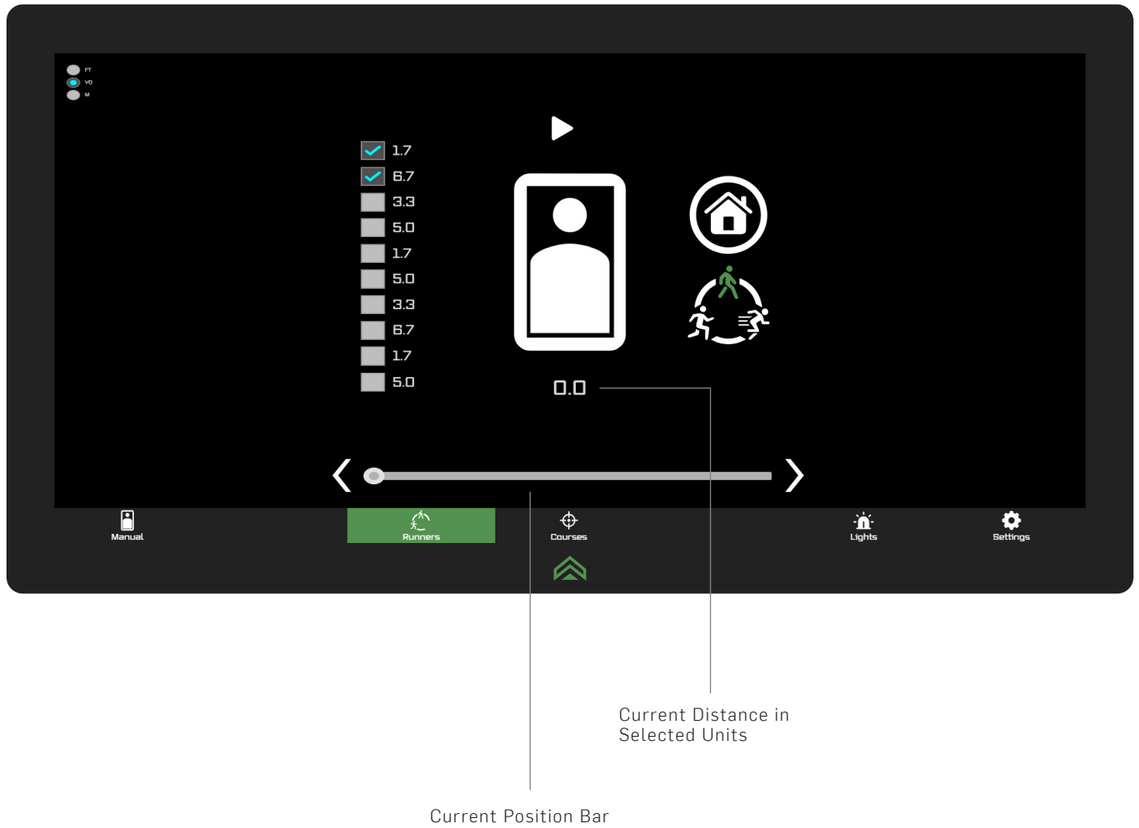
Manual
Runners
Courses
Lights
Settings
Jog Backward
Jog Forward
Select Runner Speed
Stop Distance Selection
Runner will move to first selected distance, then second, etc. until it has moved between all distances. Runner will repeat automatically until paused.
(As shown, runner will move between 1.7 and 6.7 yards until paused)

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Manual
Runners
Courses
Lights
Settings
Current Distance in Selected Units
Current Position Bar

# CONFIGURATION

# OPTIONAL MOBILE CONTROLS:

[1] Connect to the range WiFi.
- WiFi: RangeAccess
- Password: spireranges

[2] Open a web browser.

[3] Type spireos.home.arpa into the browser search bar and press enter.
- If that doesn't work, try 192.168.1.20

[4] The Operations Screen should load if everything is working correctly.

TARGET COMPONENTS:

PARTS LIST

| CODE | DESCRIPTION | PRT # |
|---|---|---|
| 1 | CUBE HOMING PROX SENSOR** | EPX-NBN40-PF |
| 2 | 1/4"-20 X 2" BUTTON HEAD SCREW - STAINLESS | HBH-25020-200-SS |
| 3 | ***1/2" X 1-1/8" X 3/8" 2RS BALL BEARING | HBR-1616-2RS |
| 4 | ***5MM X 22MM X 7MM (625-2RS) RUBBER SEALED BALL BEARING** | HBR-625-2RS-R |
| 5 | ***1/2" X 1-1/8" X 5/16" (FR8-2RS) FLANGE BALL BEARING | HBR-FR8-2RS |
| 6 | M5 X 12MM TORX BOTTON HEAD SCREW - STAINLESS STEEL** | HBT-M5X12-SS |
| 7 | M6X10 BUTTON HEAD TORX SCREW - STAINLESS** | HBT-M6X10-SS |
| 8 | M6 X 12MM TAMPER RESISTANT BUTTON HEAD TORX SCREW | HBT-M6X12-TR-SS |
| 9 | M6 X 16MM TAMPER RESISTANT BUTTON HEAD TORX SCREW | HBT-M6X16-TR-SS |
| 10 | 1/4"-20 X 1/16" CABLE GRIP** | HCG-25020-063 |
| 11 | ***460MM X 5M15 DRIVE GEAR BELT** | HDB-5M15-460 |
| 12 | 1/2" X 5M15 X 60T DRIVE GEAR WITH KEY | HDG-050-5M15-060-SPR |
| 13 | 14MM X 5M15 X 20T DRIVE GEAR | HDG-5M15-14M |
| 14 | ***1/4" X 3/8" X 3/8" FLANGE BEARING - BRONZE | HFB-250375-375 |
| 15 | ***FLANGE SLEEVE BEARING 3/8" ID | HFB-375500-500 |
| 16 | 1/4"-20 X 1/2" HEX HEAD BOLT - ZINC | HHB-25020-050-ZN |
| 17 | 1/4"-20 X 3/4" HEX HEAD BOLT - ZINC | HHB-25020-075-ZN |
| 18 | 1/4"-20 X 1-1/4" HEX HEAD BOLT - ZINC | HHB-25020-125-ZN |
| 19 | 3/8"-16 X 6" HEX HEAD BOLT FULLY THREADED - STAINLESS STEEL | HHB-37516-600-SS |
| 20 | 1" HOLE X 1/4" FLEX-GRIP LOCKING GROMMET | HLG-1000-025 |
| 21 | #10-32 THIN NYLOCK NUT - ZINC | HLN-01032-001-ZN |
| 22 | 1/4"-20 NYLOCK NUT - ZINC** | HLN-25020-005-ZN |
| 23 | 3/8"-16 THIN NYLOCK NUT - ZINC | HLN-37516-001-ZN |
| 24 | 5MM X 8MM UNDERSIZED MACHINE KEY - STAINLESS | HMK-5MMUB-8MM-SS |
| 25 | 1/2" X 1" X 1-1/4" DISC BUMPER | HRB-50098-012 |
| 26 | 1/4" X 5/8" X #10-24 SHOULDER BOLT - STAINLESS STEEL | HSB-250063-1024-SS |
| 27 | 1/2" X 1" X 3/8"-16 SHOULDER BOLT - STAINLESS STEEL | HSB-500100-37516-SS |
| 28 | MALE-FEMALE THREADED HEX STANDOFF** | HSO-M6-12MM |
| 29 | .935 OD X .187 WD X 4.50 X 305 LB/IN COMPRESSION SPRING | HSP-935187-450-CS |
| 30 | 1-1/8" X .050" INTERNAL SPIRAL RETAINING RING | HSR-11305-050-PH |
| 31 | 1/2" SHAFT EXTERNAL RETAINING RING | HSR-50002-EXT |
| 32 | 1/4"-20 X 3/8" CUP SET SCREW STAINLESS STEEL | HSS-25020-038-SS |
| 33 | 1/4" X 1/2" X 1/2" SPACER - ALUMINUM | HSW-250500-500-AL |
| 34 | 1/2" X 3/4" X 1/8" SHIM - STAINLESS STEEL | HSW-50175-013-SS |
| 35 | 1/4"-20 X 5/16" SLOT X 1/4" HEIGHT TEE NUT | HTN-25020-313-BP |
| 36 | #10 WASHER - STAINLESS STEEL | HWS-203438-1747-SS |
| 37 | .250 ID X OD .750 X .060 FLAT WASHER - ZINC | HWS-250750-060-ZN |
| 38 | .267 ID X .500 OD X .057 FLAT WASHER - STAINLESS STEEL | HWS-267500-057-SS |

** Indicates recommended replacement parts. (See p. 120 for more information)

*** Indicated parts that are consumables and are not covered under the warranty agreement. In addition, any misuse, lack of maintenance, and/or modifications made to any Spire products will void all warrantees.

| CODE | DESCRIPTION | PRT # |
|---|---|---|
| 39 | .375 ID X .812 OD X .062 FLAT WASHER - ZINC | HWS-375812-060-ZN |
| 40 | .500 ID X 1.060 OD X .070 FLAT WASHER - ZINC | HWS-5001060-070-ZN |
| 41 | M5 WASHER - STAINLESS STEEL** | HWS-M5X10-010-SS |
| 42 | TARGETRY DRIVE MOTOR - IP RATED** | MTR-DRV-IP65 |
| 43 | RECON WHEEL HUB HOUSING | RCP-7325-111 |
| 44 | ASCENT CARRIER BASE - POWDER COATED | TGP-140-002-PC |
| 45 | URBAN CARRIER SIDE COVER - POWDER COATED | TGP-140-007-PC |
| 46 | ASCENT CABLE HARNESS BRACKET - POWDER COATED | TGP-140-008-PC |
| 47 | ASCENT CARRIER CENTERING WHEEL BRACKET | TGP-140-011 |
| 48 | ASCENT DRIVE PULLEY** | TGP-430-005 |
| 49 | ASCENT TENSIONER PULLEY | TGP-430-006 |
| 50 | RECON TENSIONER SHAFT | TGP-430-007 |
| 51 | ASCENT PULLEY DRIVE SHAFT | TGP-430-009 |
| 52 | ASCENT RUNNER MOTOR MOUNT PLATE | TGP-431-001 |
| 53 | RUNNER MOTOR HOUSING SIDE PANEL | TGP-431-002 |
| 54 | RUNNER MOTOR HOUSING TOP PANEL | TGP-431-003 |
| 55 | RUNNER MOTOR HOUSING BOTTOM PANEL | TGP-431-004 |
| 56 | RUNNER MOTOR HOUSING GAP PANEL | TGP-431-005 |

** Indicates recommended replacement parts. (See p. 52 for more information)

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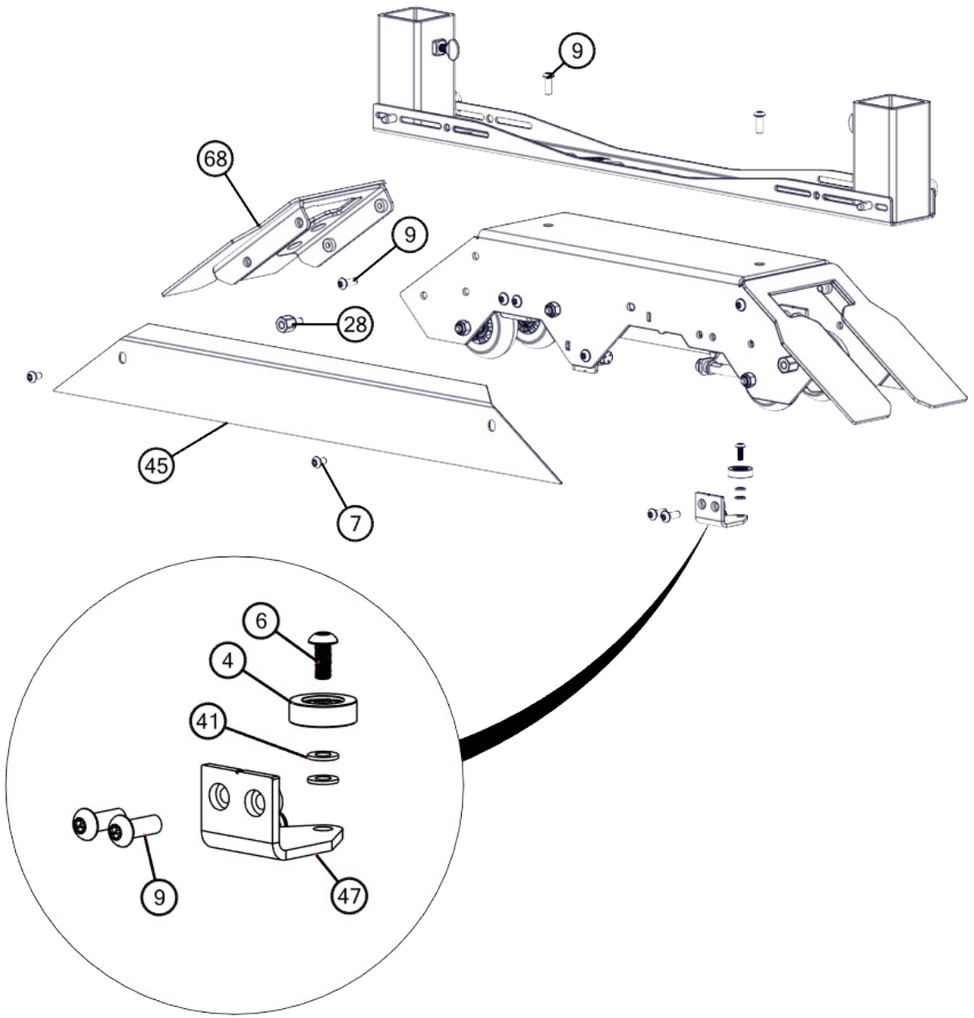
| CODE | DESCRIPTION | PRT # |
|---|---|---|
| 57 | RUNNER MOTOR HOUSING CABLE COVER | TGP-431-006 |
| 58 | ASCENT RUNNER GEAR COVER | TGP-431-007 |
| 59 | ASCENT ADJUSTABLE RETURN PULLEY PLATE | TGP-610-001 |
| 60 | ASCENT RETURN PULLEY SPRING ADJUSTMENT BRACKET | TGP-610-003 |
| 61 | ***ASCENT RETURN PULLEY SPRING GLIDE PLATE | TGP-610-004 |
| 62 | ASCENT RETURN PULLEY SPRING BACKER PLATE | TGP-610-005 |
| 63 | ASCENT RETURN PULLEY COVER | TGP-610-006 |
| 64 | ASCENT REAR STOP WELDMENT - POWDER COATED | TGW-140-002-PC |
| 65 | ASCENT RETURN PULLEY SPRING PULL BRACKET | TGW-610-002 |
| 66 | ***RECON/URBAN END STOP BRACKET - LEFT | TKP-7040-151 |
| 67 | ***TRACK SPLIT HANGER BRACKET | TKP-7040-172 |
| 68 | ***ASCENT HOMING BRACKET - POWDER COATED | TKP-7040-186-PC |
| 69 | ***URBAN RETURN PULLEY** | URP-7124-011 |
| 70 | ***ROLLER BLADE WHEEL ASSEMBLY | WHA-7010-001 |
| 71 | ***STICK TURNER CLAMP KIT | TGA-330-CLMP-STX |
| 71.1 | 1/4" X 2-1/2" STEEL RING-GRIP QUICK-RELEASE PIN** | HRP-025-250 |
| 71.2 | 1/4"-20 X 3/4" SPADE THUMB SCREW - ZINC** | HST-25020-075-ZN |
| 71.3 | STICK TURNER BRACKET - POWDER COATED | TGP-330-001-PC |
| 71.4 | STICK TURNER CLAMP TUBE - POWDER COATED | TGP-330-005-PC |

# ASCENT-R (STICK CLAMP)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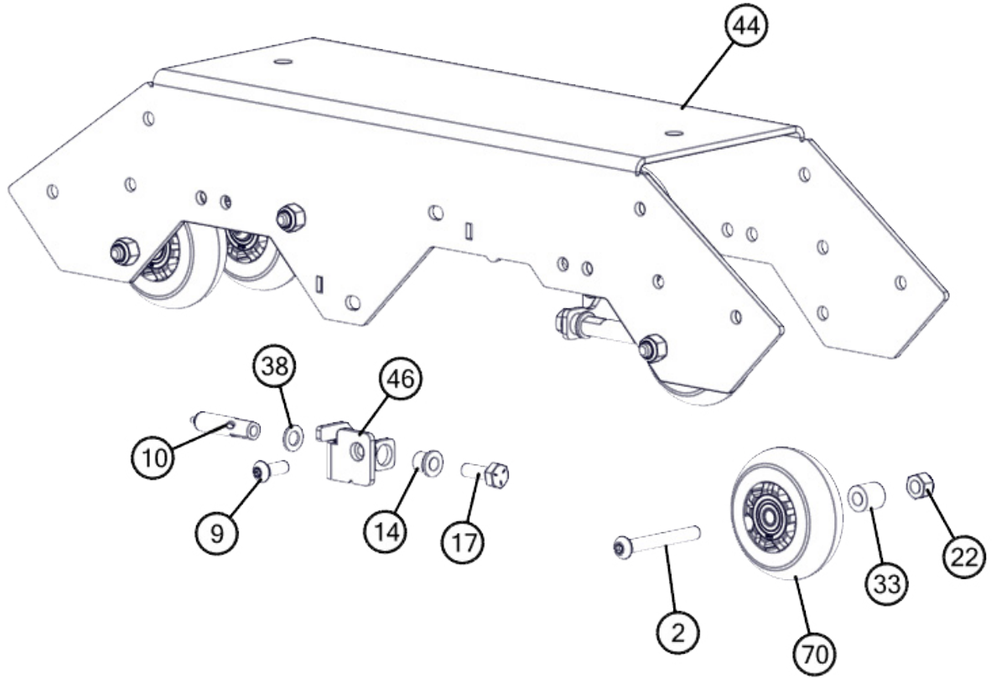
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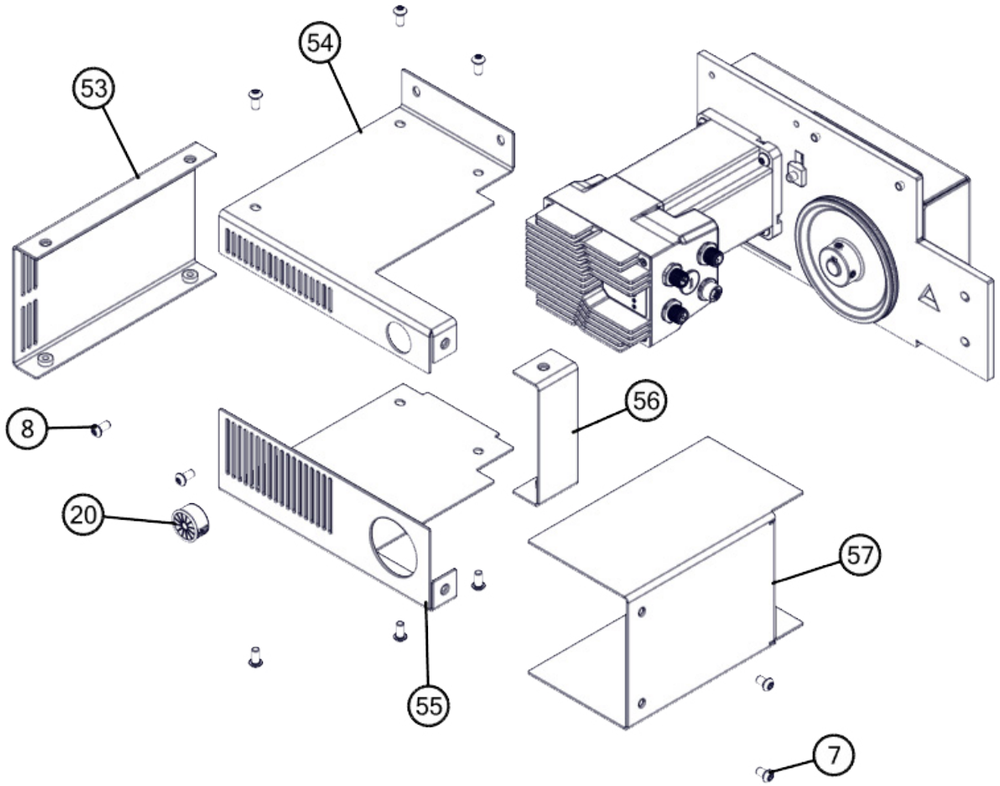
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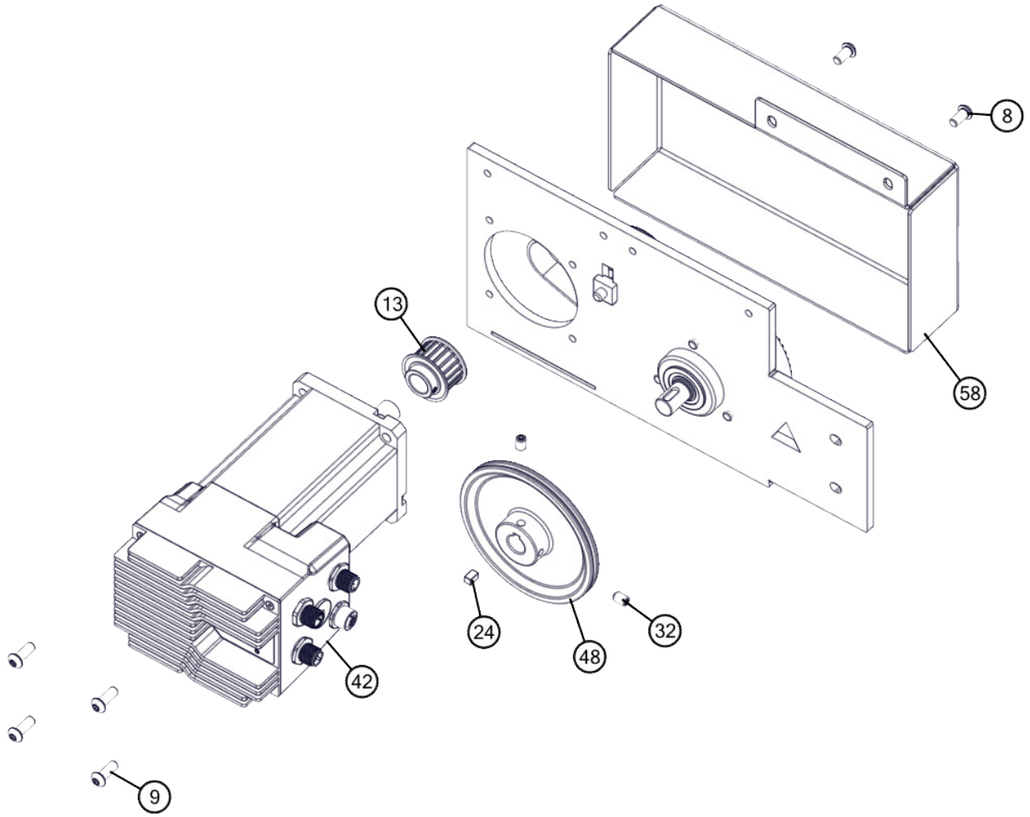
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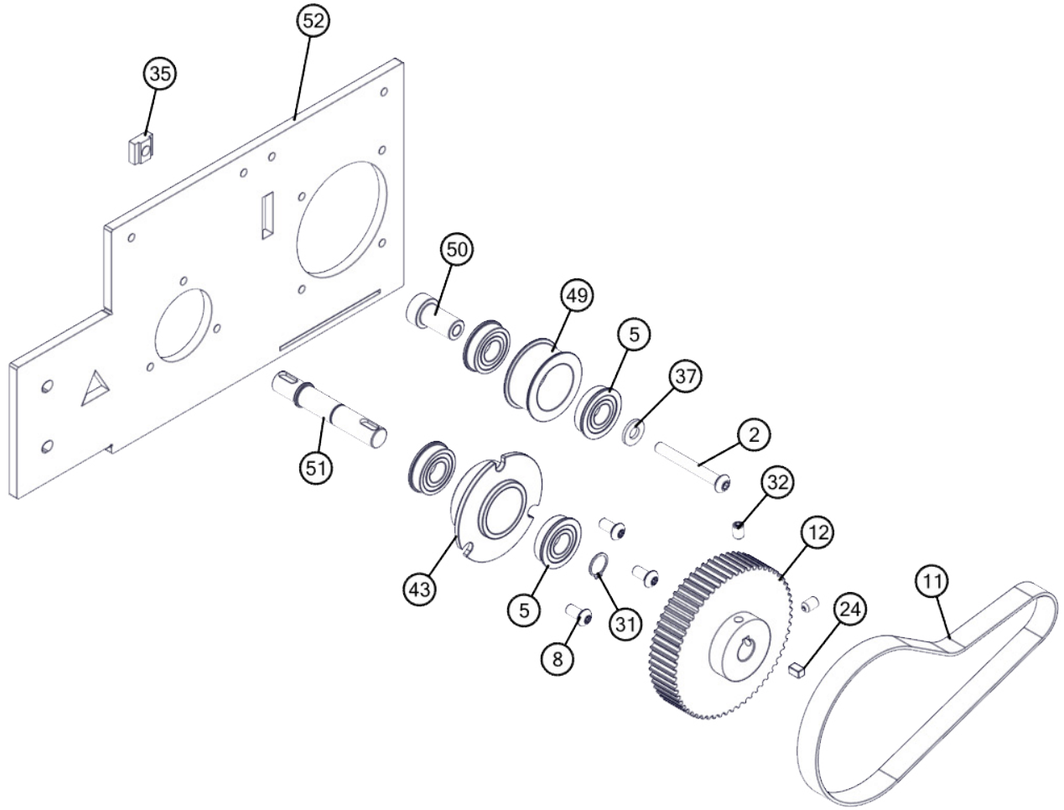
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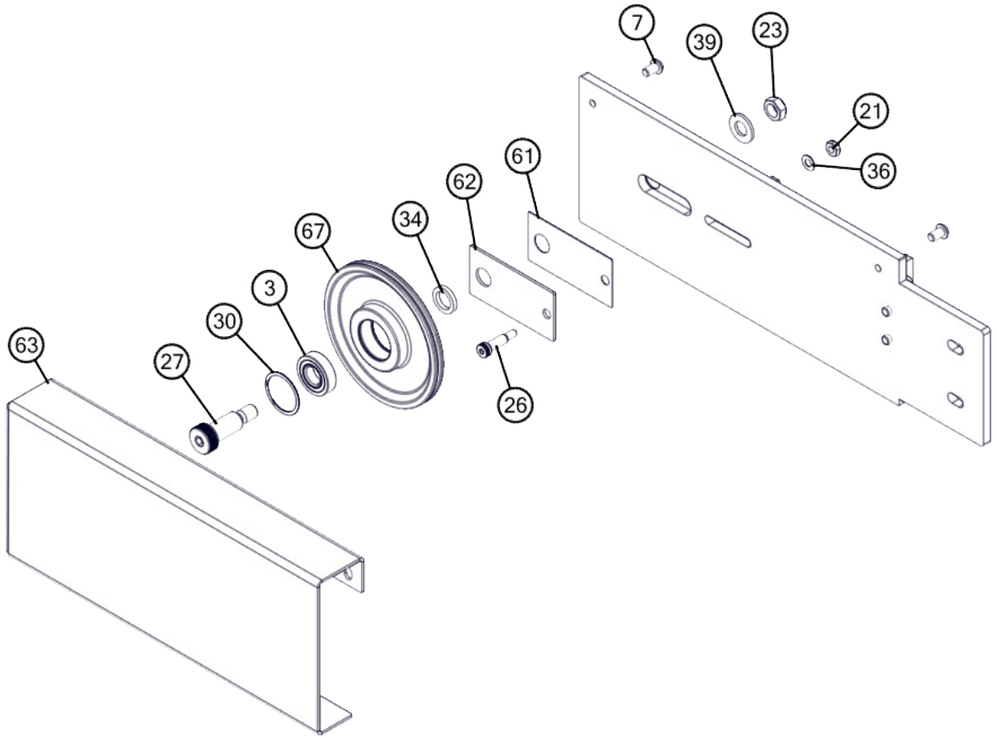
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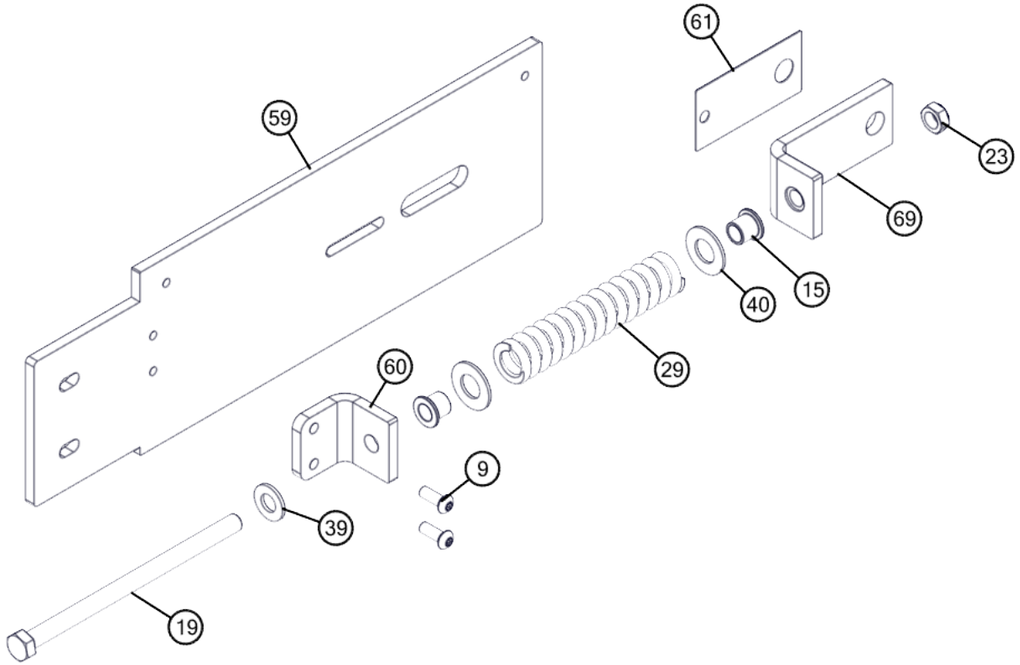
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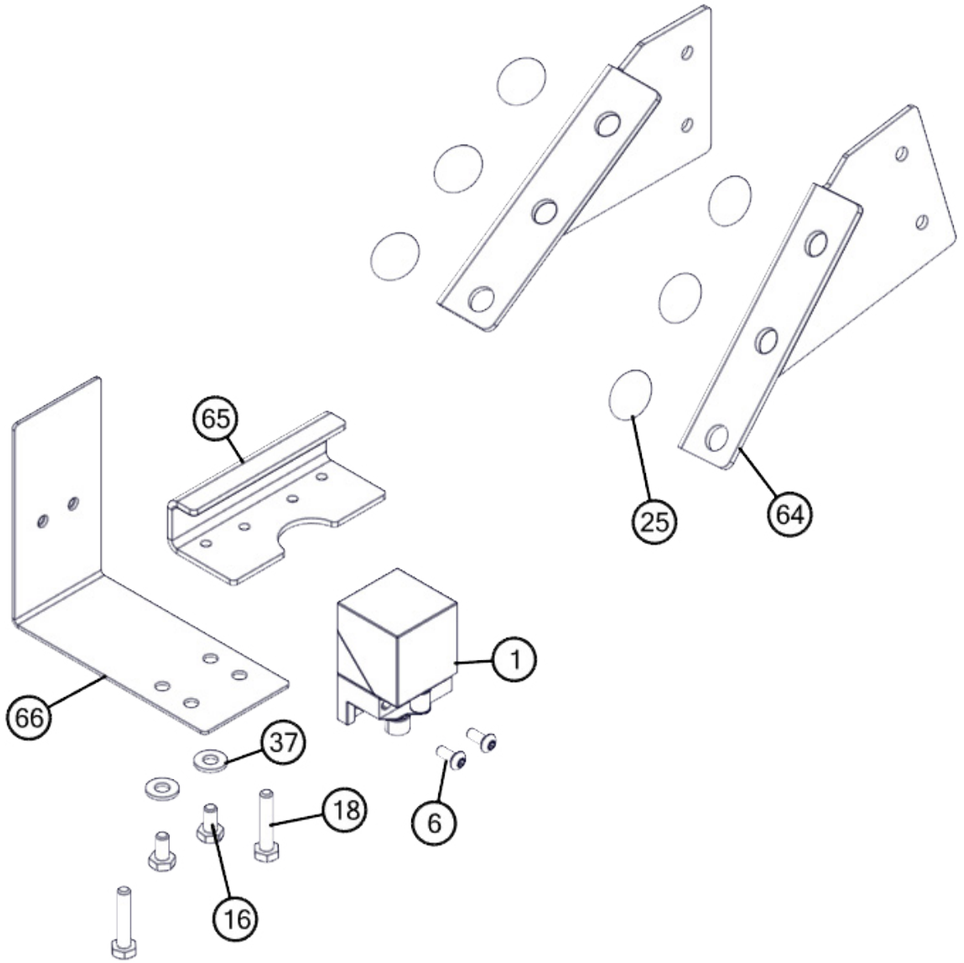
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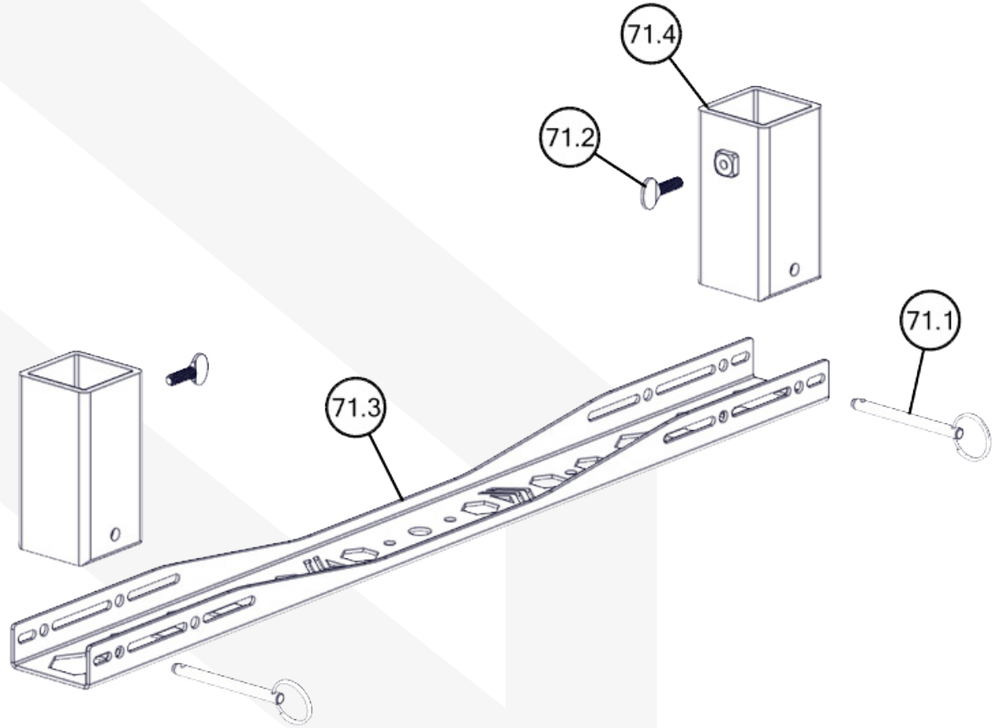
# CLAMPS



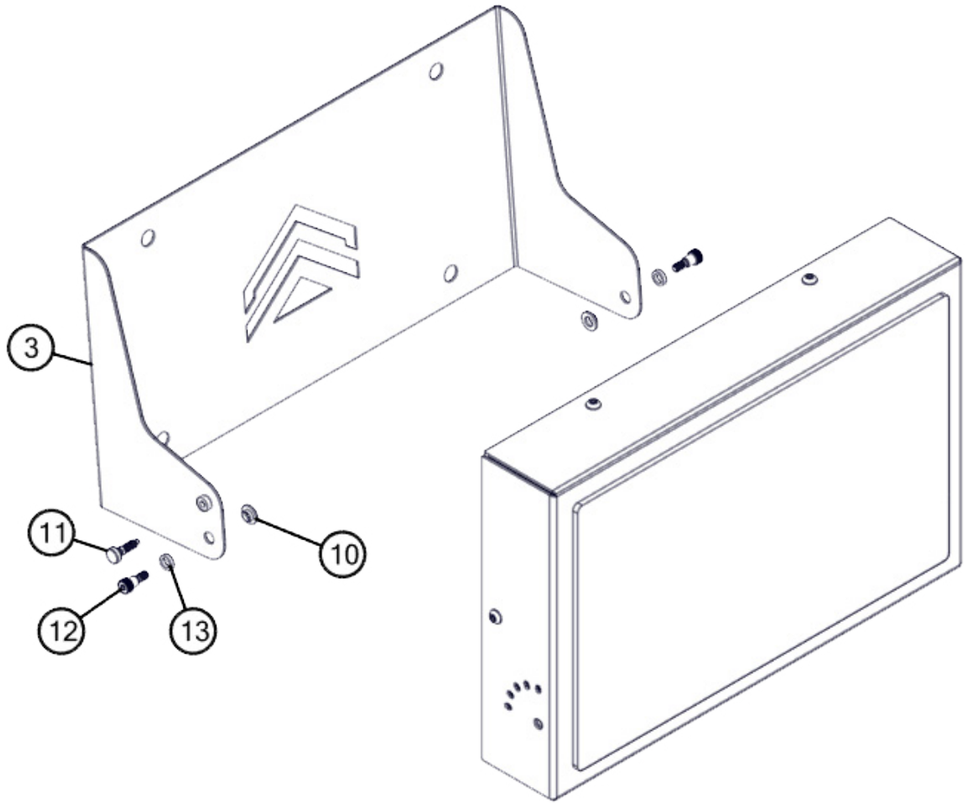
# MASTER CONTROL

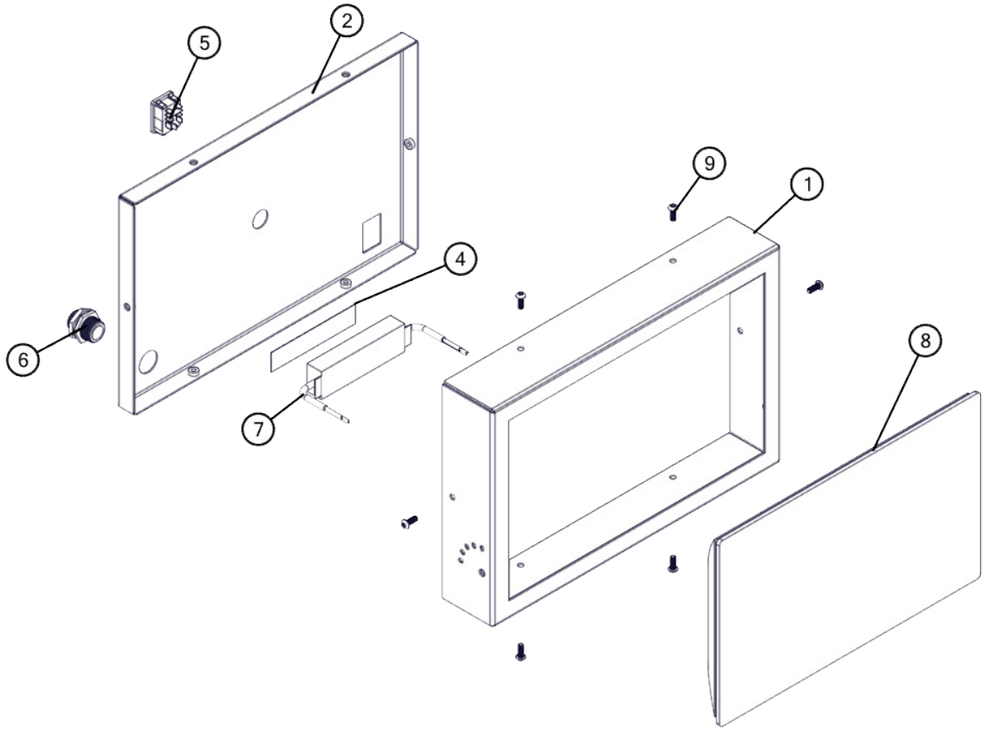


| CODE | DESCRIPTION | PRT # | QTY |
|---|---|---|---|
| 1 | 15" HMI ENCLOSURE COVER - POWDER COATED | CTP-7915-231 | 1 |
| 2 | 15" HMI ENCLOSURE BACK PANEL - WAGO | CTP-7915-232 | 1 |
| 3 | 15" HMI ENCLOSURE MOUNTING BASE - WAGO | CTP-7915-233 | 1 |
| 4 | 1" X .030 GORILLA DOUBLE SIDED TAPE | DST-1000G-030 | 1 |
| 5 | POWER INPUT SWITCH | ELE-2032-030 | 1 |
| 6 | CAT-6 RJ45 BULKHEAD COUPLER | ELE-31C6-RJ45 | 1 |
| 7 | 24VDC 2.5A POWER SUPPLY - 60W | ELE-6024-060 | 1 |
| 8 | 15.6" HMI - WAGO WEB PANEL | ELE-65156-WWP | 1 |
| 9 | 1/4"-20 X 5/8" BUTTON HEAD SCREW - BLACK OXIDE | HBH-25020-063-BK | 6 |
| 10 | .313 X .620 X .060 INSULATION WASHER - NYLON | HIW-313620-060-NY | 2 |
| 11 | 1/4"-20 X 1/2" RETURN SPRING PLUNGER** | HRS-25020-050 | 1 |
| 12 | 5/16" X 5/16" X 1/4"-20 SHOULDER BOLT | HSB-313313-25020 | 2 |
| 13 | .317 ID X .500 OD X .125 FLAT WASHER - NYLON | HWS-317500-125-NY | 2 |

** Indicates recommended replacement parts. (See p. 52 for more information)

*** Indicated parts that are consumables and are not covered under the warranty agreement. In addition, any misuse, lack of maintenance, and/or modifications made to any Spire products will void all warrantees.




| POWER | VALUE |
|---|---|
| Power Consumption | 24 VDC |
| Voltage | 20.8 Watts Max |

| TEMPERATURE | VALUE |
|---|---|
| Operating | -20-55°C (-4-131°F) |
| Storage | -20-70°C (-4-158°F) |

MAINTENANCE:



## ROUTINE MAINTENANCE

| TIME TABLE | PROCEDURE |
|---|---|
| Daily | 1. Inspect the top of the track to ensure that no debris is jammed in it, or wedged between the track hanger and the track. Remove debris as necessary.<br>2. Inspect under the proximity sensor switch bracket and make sure that no debris is jammed in it. Remove debris as necessary. |
| Monthly | 1. Check each screw on the clamp and shaft to ensure they have remained tight. If they are loose, add medium-strength Loctite and torque them to 80 in-lbs.<br>2. Inspect the top and bottom of the track for damage. Smooth out damage with hand tools as necessary.<br>3. Inspect track bolts. Tighten and replace as needed. |
| Biannually | 1. Check surge protector inside main control box and replace if needed.<br>2. Inspect cable tension and tighten if needed.<br>3. Shut power off to the drive unit. Manually move the carrier to check how smoothly it moves down the track. Return the carrier to the home position and turn the drive unit back on. Replace wheels as necessary. |
| Yearly | 1. Check all the screws and bolts on the unit and the mounting assembly have remained tight. If any are loose, add medium-strength Loctite and hand tighten.<br>2. With power off, check all wire connections are tight and not damaged. If they are loose, hand tighten them. |
| As needed | 1. Replace the aircraft cable.<br>2. Replace gear belt when deteriated/worn. |

# TOOLS



## LIST OF TOOLS

- T-30 Torx Driver
- T-25 Torx Driver
- 7/16 Socket/Wrench
- 5/16 Allen Wrench
- Medium-Strength Thread Locker
- Mini Flathead Screwdriver
- #2 Phillips Screwdriver
- Multimeter

# RECOMMENDED REPLACEMENT PARTS

| DESCRIPTION | PRT # | QTY |
|---|---|---|
| HIDDEN CLAMP | TGA-300-CLMP-HD | 1 |
| EXPOSED AR-500 CLAMP | TGA-300-CLMP-EX | 1 |
| STICKS CLAMP | TGA-300-CLMP-STX | 1 |
| MOTOR*** | MTR-DRV-STND-IP | 1 |
| PLC | ELE-6005-530 | 1 |
| SURGE PROTECTOR MODULE | ELE-CITEL-MOD | 1 |
| AIRCRAFT CABLE 500FT | SAC-0116-500 | 1 |
| RETURN PULLEY | URA-7100-102 | 1 |
| MOTOR PULLEY | TGP-430-005 | 1 |
| HOME SENSOR | EXP-NBN40-PF | 1 |
| TRACK BUMPERS x2 | RBR-250150-1500 | 1 |
| ASCENT-r HARDWARE REPLACEMENT KIT (Below items are included in kit) | PEAK-360-HARDWARE-KIT | 1 |
| MEDIUM-STRENGTH LOCTITE | THREADLOCK-MS-06ML | 1 |
| CABLE GRIP | HCG-25020-063 | 3 |
| QUICK RELEASE PIN | HRP-025-250 | 2 |
| WHEEL BUTTON SCREW | HBT-M5X12-SS | 10 |
| HOGAN HOUSE LID BUTTON SCREW | HBT-M6X10-SS | 10 |
| THUMB SCREW | HST-25020-075-ZN | 2 |

*** Indicates parts that will need to be programmed for a specific lane. It is recommended for them to be purchased and to remain on Spire shelves where they can be programmed to a specific lane as needed.

| DESCRIPTION | PRT # | QTY |
|---|---|---|
| PULLEY SET SCREW | HSS-25020-038-SS | 5 |
| GEAR SET SCREW | HSS-01032-019-BK | 10 |
| TRACK BRACKET HEX BOLT | HHB-25020-100-ZN | 5 |
| TRACK HEX BOLT | HHB-25020-050-ZN | 10 |
| TRACK THIN LOCKNUT | HLN-25020-001-ZN | 15 |
| CARRIER COVER STANDOFF | HSO-M6-12MM-ZN | 2 |
| RUBBER GUIDE WHEELS | HBR-625-2RS-R | 4 |
| GUIDE WHEEL SPACERS | HWS-M5X10-010-SS | 10 |

# SERVICE PLANS:



## OVERVIEW

At the core of Spire Ranges is our commitment to keep our installed equipment in each range running at its optimum performance. To maintain that standard, below is a list of the different service package levels available to our clients. We look forward to providing your range with a quote that is unique to your range.

| *LEVEL* | *TRIPS PER YEAR* | *PARTS DISCOUNT* |
|---|---|---|
| Bronze | 1 | 0% |
| Silver | 2 | 5% |
| Gold | 4 | 10% |

## SERVICES OFFERED WITH EACH SITE VISIT:

- Provided Refresher Training
- Software Update/Reconfiguration
- Test all Motors, Valves, Cylinders, Lights, & Proximity Switches
- Target Clamp Inspection/Adjustment
- Check/Secure Electrical Connections
- Verify Proper Voltages
- Verify Controller(s) (HMIs/Computer) Functionality
- Assess Cable Tension & Adjust
- Assess Track Health & Tighten/Replace any Loose/Missing Hardware
- Verify Proper Charging of Targets
- Stall/Bench Inspection
- Trap Inspection
- Overall Range Health Inspection

# TROUBLESHOOTING:

Given below are possible causes and solutions for system problems. Within this section, you will find sequential steps that can be used to help troubleshoot a problem. If a problem persists after following these troubleshooting guidelines, please contact the Spire support team.

## 1.0 HMI TOUCH SCREENS (MASTER & LOCAL)

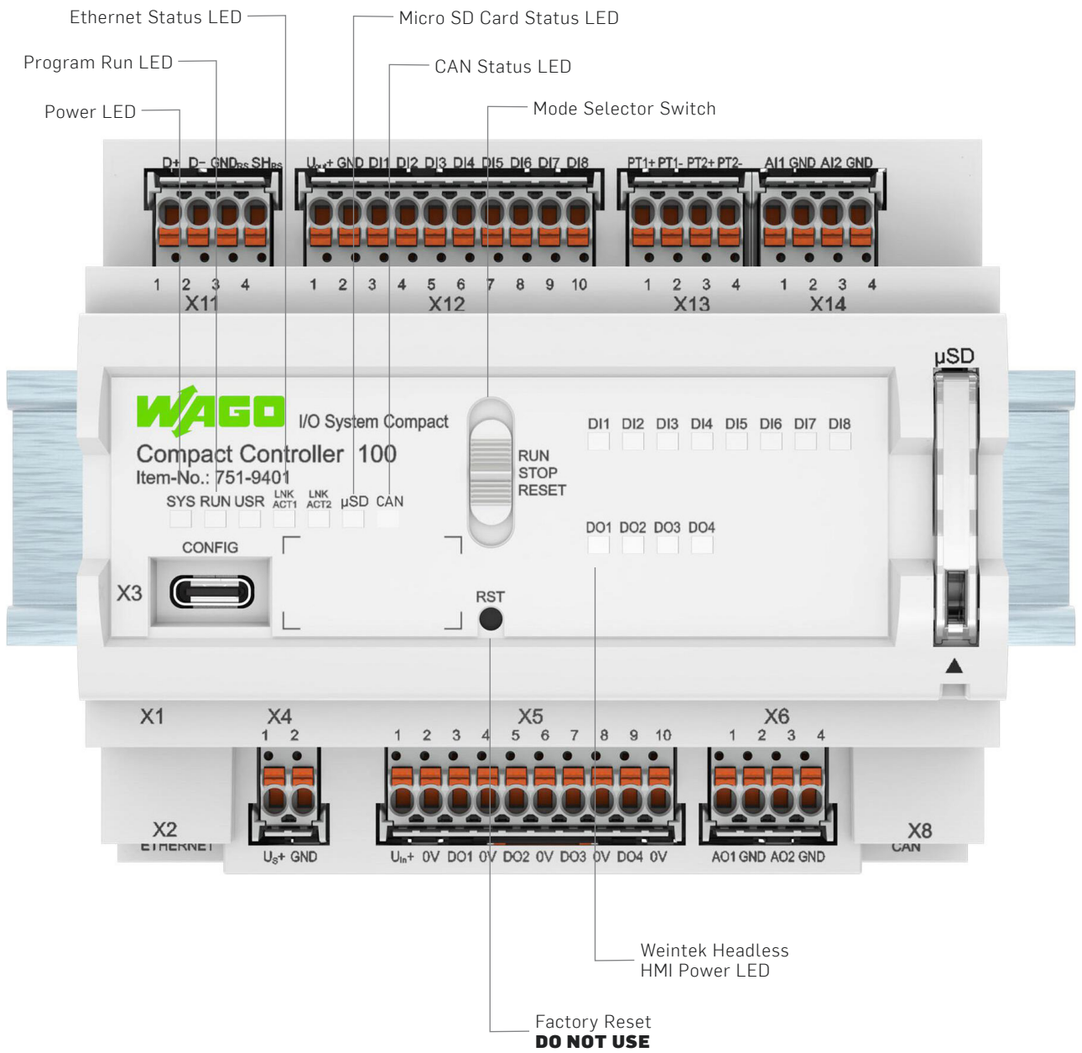
| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 1.1 Dark Blank Screen | (1) No power supplied to HMI | (1) Check the power supply connection. (2) Check circuit breaker to see if tripped. (3) If problem persists, contact Spire for technical support. |
| 1.2 Entire HMI Touch Screen Nonresponsive | (1) HMI error | (1) Cycle power to HMI. |
| | (2) HMI / PLC fault | (1) Cycle power to the PLC. |
| 1.3 Communication error | (1) Ethernet (RJ45) cable unplugged or damaged | (1) Check all RJ45 connections in control panel. (2) Check RJ45 connection to screen. (3) Follow cable to ensure they are not smashed or damaged. |
| | (2) PLC error | (1) Cycle power to the PLC. (2) See section 6 for more information on PLC errors. |
| 1.4 Max number of visualization clients reached | (1) Too many browsers are connected at once | (1) Up to 3 devices can be using the interface at one time. If a local/master touch screen is present, both will count as a device. Disconnect any device that is not needed/wanted. (2) Reload the webpage. |
| | (2) PLC error | (1) Cycle power to the PLC. |



## 2.0 ASCENT TARGET UNITS

| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 2.0 Target continues to home | (1) Homing sensor misalignment | (1) Loosen two adjustment bolts on homing sensor. (2) Adjust homing sensor in/out and twist closer/further to the carrier. |
| | (2) Homing sensor malfunction | (1) See section 9.0 - 9.1. |
| 2.1 Individual nonresponsive target (not moving) | (1) Not homed | (1) On the runner operation screen, press the home button. Carrier should slowly move to home. (2) If the problem persists, cycle power to the range. Wait 5 min before turning back on. |
| | (2) Stuck at Home after homing | (1) Move the carrier slightly to get it unstuck. (2) For a more permanent solution, inspect carrier/track for what is holding it up. Rectify the problem and try operating again. |
| | (3) Obstruction in drive system | (1) Power off the target. (2) Check the track/wheels/belt for obstruction. (3) Remove obstruction if one is present. |
| | (4) Motor fault | (1) Contact Spire for technical support. |
| | (5) No power | (1) Check circuit breakers. |
| 2.2 Target faulting at same location repeatedly | (1) Obstruction/damage to track | (1) Remove obstruction if one is present. (2) Repair/replace track if damaged. |

## PLC LED STATUS



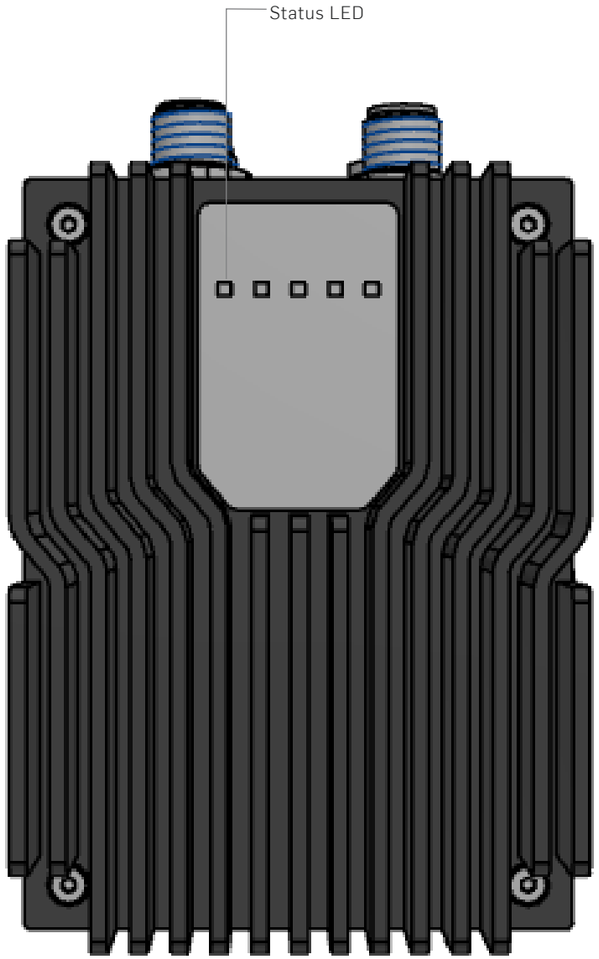

| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 6.0 No SYS (Power) Light | (1) Bad power cable connection/damaged cable | (1) Inspect the PLC power cable (cable coming out of the bottom of the PLC in connector X4) for damage. (2) Ensure that the PSU in the control box has power and that no breakers are flipped. |
| | (2) Bad PLC | (1) Contact Spire for a replacement PLC. |
| 6.1 Orange SYS Light | (1) Device is in startup/boot process | (1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller. |
| | (2) Bad PLC | (1) Power cycle the controller. (2) Contact Spire for a replacement PLC. |
| 6.2 Orange Flashing SYS Light | (1) “Fix IP Address” mode (temporary setting until the next reboot due to RST button press) | (1) Connect to the device via the standard address (192.168.1.17) or restart the device to restore the original value set. |
| | (2) Bad PLC | (1) Power cycle the controller. (2) Contact Spire for a replacement PLC. |
| 6.3 Green/Red Flashing SYS Light | (1) Firmware update mode | (1) Wait 30 min and check again. (2) If it continues to stay in this state, contact Spire. |
| | (2) Bad PLC | (1) Power cycle the controller. (2) Contact Spire for a replacement PLC. |
| 6.4 Green Flashing RUN Light | (1) No application and now boot project loaded | (1) Power cycle the controller. (2) Contact Spire for a replacement PLC. |
| 6.5 Red RUN Light | (1) Applications loaded and all in the “STOP” status | (1) Set the mode selector switch to “RUN” to start the application |
| 6.6 Green/Red Flashing RUN Light | (1) At least one application in the “RUN” status and one in the "STOP" status | (1) Power cycle the controller. (2) Contact Spire for a replacement PLC. |
| 6.7 Red (goes out briefly) RUN Light | (1) Warm start reset completed | (1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller. |
| 6.8 Red (goes out longer) RUN Light | (1) Cold start reset completed | (1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller. |

| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 6.9 Red Flashing RUN Light | (1) At least one application after in the “STOP” status after exception (e.g., memory access error) | (1) Start the application with a reset via the mode selector switch. (2) Power cycle the controller. (3) Contact Spire for a replacement PLC. |
| 6.10 Orange/Green Flashing RUN Light | (1) Load above threshold value 1 | (1) Power cycle the controller. (2) Contact Spire for a replacement PLC. |
| 6.11 Orange RUN Light | (1) Runtime system in debug state (breakpoint, single step, individual cycle) | (1) Start the application with a reset via the mode selector switch (hold in reset position for 5 seconds then move back to RUN position). (2) Power cycle the controller. (3) Contact Spire for a replacement PLC. |
| 6.12 No RUN Light | (1) No runtime system loaded | (1) Power cycle the controller. (2) Contact Spire for a replacement PLC. |
| 6.13 No Green LNK ACT 1 (Ethernet Status) Light | (1) Bad/damaged ethernet cable | (1) Replace ethernet cable. |
| | (2) Bad/damaged ethernet switch | (1) Swap PLC ethernet cable to another port on the switch. |
| | (3) Bad PLC | (1) Contact Spire for a replacement PLC. |
| 6.14 No mSD Light | (1) No memory card access | (1) Some ranges may not have a micro SD card. If this is the case, then disregard the missing light. |
| 6.15 No CAN Light | (1) The CAN interface has not been configured | (1) Power cycle the controller. (2) Contact Spire for a replacement PLC. |
| 6.16 Alternating red 50 ms / green 50 ms CAN Light | (1) Configuration in progress | (1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller. |
| 6.17 Alternating red 200 ms / green 200 ms CAN Light | (1) Configuration invalid | (1) Power cycle the controller. (2) Contact Spire for a replacement PLC. |
| 6.18 Green 200 ms / off 800 ms CAN Light | (1) The CANopen interface has the status “Stop” | (1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller. |
| 6.19 Green 200 ms / off 200 ms CAN Light | (1) The CANopen interface has the status “Preoperational” | (1) Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller. |



| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 6.20 Red CAN Light | (1) The CANopen interface has the status “Bus Off” (short-circuit or other major fault) | (1) Check the CANbus connections (comms cable). Wait 5 min and check again. (2) If it continues to stay in this state, power cycle the controller. |
| 6.21 No DO1 Light | (1) No Headless Wientek in system | (1) Some systems do not have a headless wientek. If this is the case, ignore this. |
| | (2) Runtime not fully loaded | (1) See 6.4 - 6.12. |

# MOTOR LED STATUS

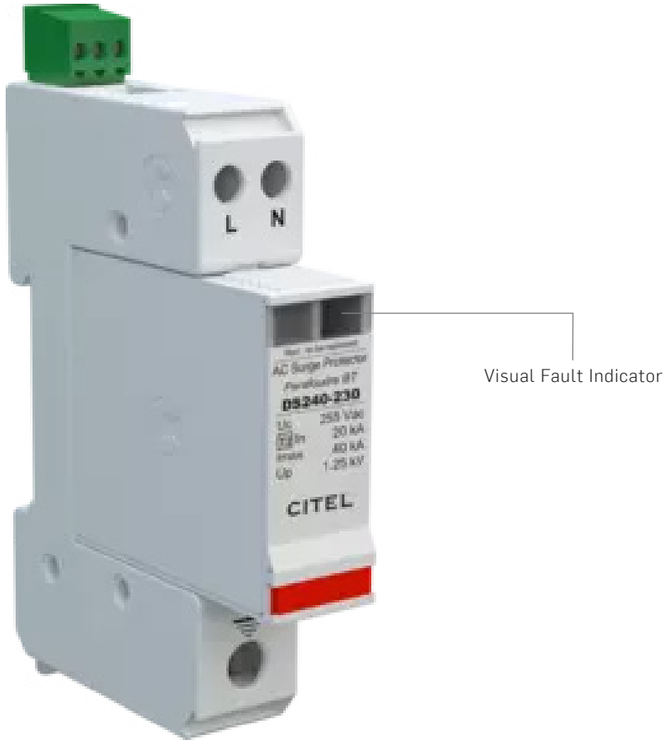



| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 7.0 No Light | (1) Bad power cable connection/damaged cable | (1) Inspect the motor power cable (X3) for damage. (2) Ensure that the PSU has power and that no breakers are flipped. |
| | (2) Bad motor | (1) Contact Spire for a replacement motor. |
| 7.1 Blinking Green Light (1sec interval) | (1) Device is operating normally | (1) N/A |
| 7.2 One On, One Off Green Light | (1) General error | (1) Recalibrate the motor. |
| 7.3 Two On, One Off Green Light | (1) Voltage error | (1) Check that capacitor is in place on the PSU and recalibrate the motor. (2) Ensure the PSU is supplying 48V DC to the motor. |
| 7.4 Three On, One Off Green Light | (1) Temperature error | (1) Power down the system and let it cool down for 10-15 minutes. |
| 7.5 Four On, One Off Green Light | (1) Overcurrent error | (1) Check that there are no debris in the clamp or motor housing. |
| 7.6 Five On, One Off Green Light | (1) Controller error | (1) Power cycle the system. (2) Contact Spire for a replacement motor. |
| 7.7 Six On, One Off Green Light | (1) Watchdog-Reset error | (1) See 6.0 - 6.20. (2) Contact Spire for a replacement motor. |

## CLAMP HOMING SENSOR LED STATUS


| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 9.0 No Green Light | (1) Bad cable connection/damaged cable | (1) Inspect the cable for damage. (2) Ensure that the PSU has power and that no breakers are flipped. (3) Check wires going into the larger green motor connector. Ensure that all wires are seated fully inside the connector. |
| | (2) Bad PSU | (1) Contact Spire for a replacement PSU. |
| | (3) Bad sensor | (1) Contact Spire for a replacement sensor. |
| 9.1 No Yellow Light | (1) Clamp homing bracket not detected | (1) Adjust the sensor position to be closer to the travel location of the clamp homing bracket. (2) Recalibrate the lane. |
| | (2) Bad cable connection/damaged cable | (1) Inspect the cable for damage. (2) Check wires going into the larger green motor connector. Ensure that all wires are seated fully inside the connector. |
| | (3) Bad sensor | (1) Place a piece of metal over the sensor area temporarily to determin if sensor is operational. If not detected, contact Spire for a replacement sensor. |

# SURGE PROTECTOR STATUS




| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 10.0 One visual Indicator is red | (1) Module has experienced a surge | (1) Replace module at owner's convenience. |
| 10.1 Both visual Indicators are red | (1) Module has experienced multiple surges | (1) Not able to protect. Replace module immediately. |

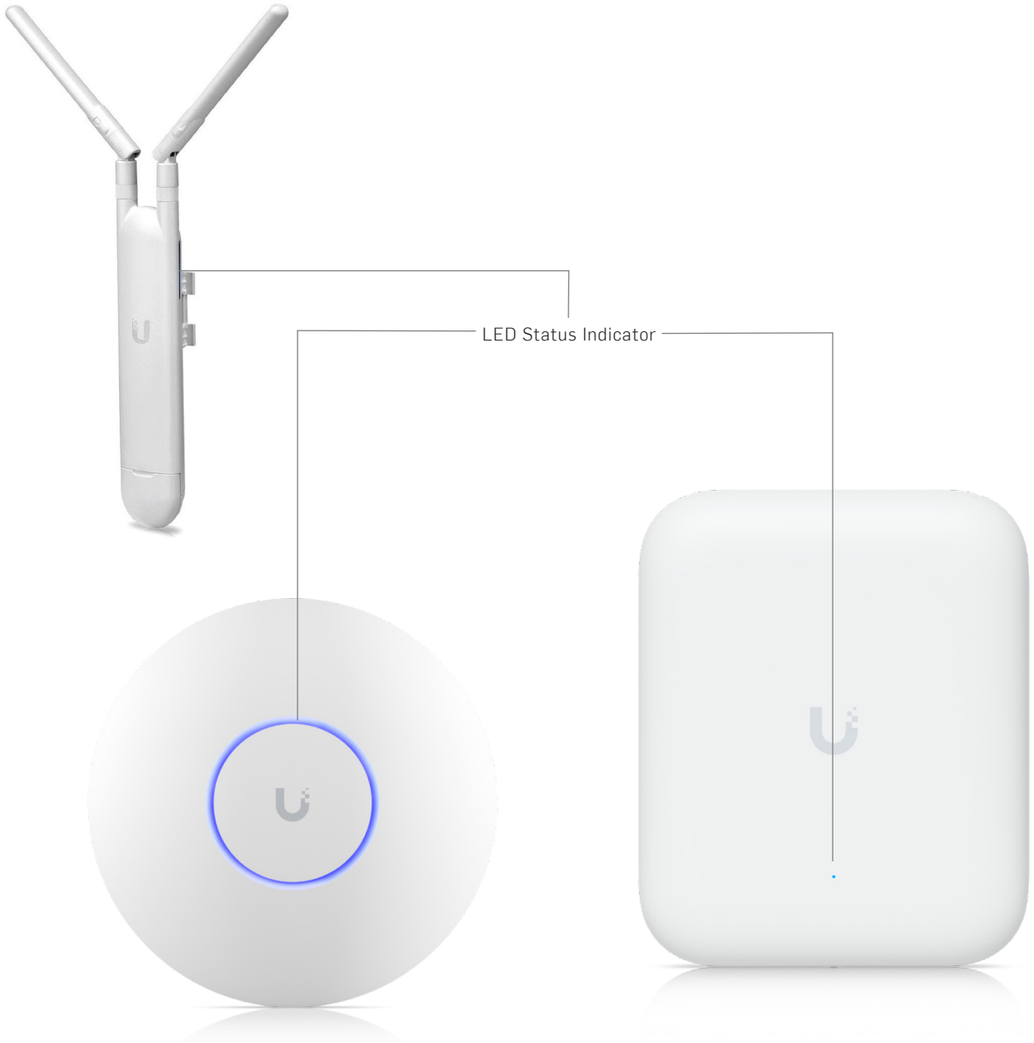
# POE INJECTOR STATUS


Standard Port

POE Port

| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 11.0 Steady White Light | (1) Operating correctly | (1) No troubleshooting needed. |
| 11.1 Blinking Light | (1) Bad wiring | (1) Double check wiring. (2) Replace RJ45 ends on both ends of the ethernet cable in the POE port. (3) If not solved, replace ethernet cable. |
| | (2) Bad POE Injector | (1) Replace POE Injector. |
| 11.2 No Light (Off) | (1) Not receiving power | (1) Check wiring. (2) Check breaker. |
| | (2) Bad POE Injector | (1) Replace POE Injector. |

# ACCESS POINT (AP) STATUS




| PROBLEM | POSSIBLE CAUSE | POSSIBLE SOLUTION |
|---|---|---|
| 12.0 Flashing White / Off Every 1/2s | (1) The device is initializing and booting up | (1) Wait 5 min. (2) If it does not resolve itself, contact Spire for a replacement. |
| 12.1 Steady White | (1) AP had power event that caused it to lose it programming. | (1) Wait 5 min. (2) If it does not resolve itself, contact Spire for a replacement or a reprogramming. |
| 12.2 Slow Flashing Blue | (1) The device is initializing and booting up | (1) Wait 5 min. (2) If it does not resolve itself, contact Spire for a replacement. |
| 12.3 Blue and Flashing Off Every 5s | (1) The device is initializing and booting up | (1) Wait 5 min. (2) If it does not resolve itself, contact Spire for a replacement. |
| 12.4 Steady Blue | (1) Operating correctly | (1) No troubleshooting needed. |
| 12.5 Strobing White / Off | (1) Internal error | (1) Power cycle the AP. (2) If it does not resolve itself, contact Spire for a replacement. |
| 12.6 Quickly Flashing White / Blue | (1) The device firmware is currently being upgraded - do not interrupt the process. | (1) Wait 15 min. (2) If it does not resolve itself, contact Spire for a replacement. |
| 12.7 Blue and Flashing Off Every 5s | (1) Access Point has lost network connectivity and is searching for a wireless uplink. | (1) Check any and all ethernet cables between the AP and the router. (2) If it does not resolve itself, contact Spire for further troubleshooting. |
| 12.8 Rapid Flashing Blue / Off | (1) The device "Locate" feature was activated in the UniFi Network application. | (1) Power cycle the AP. (2) If it does not resolve itself, contact Spire for a replacement. |
| 12.9 Flashing White-Blue-Off | (1) The device is in TFTP mode. | (1) If this wasn't intentional, please ensure the device's reset button isn't jammed (it should click when pushed). |
| 12.10 LED Off | (1) Bad power | (1) Verify the Power, POE, and Ethernet cables to troubleshoot. |
| | (2) Bad AP | (1) Contact Spire for a replacement. |

# GLOSSARY:

| TERM | DEFINITION |
|---|---|
| Calibration | Adjusting the various parts of the system precisely for their particular function. |
| Consumable Components | Products that are expected to wear out and that get used up throughout the lifetime of the product (will need to be replaced on a regular basis). |
| Course (of Fire) | The programmed set of actions for each shooting target. |
| Edge | The side of the shooting target (not face or back). |
| Error / Warning / Alarm | A minor problem with the system, but the system will still run. |
| Exposure Times | The amount of time the face (not the edge) will be positioned toward the shooter. |
| Fault | A major problem with the system. The system will not run. |
| HMI | A human-machine interface, which is a feature of any device that enables humans to engage and interact with machines. Common examples include touchscreens and keyboards. |
| Loctite | A brand of adhesives that is used to prevent loosening of metal fasteners caused by vibrations. |
| PLC | A programmable logic controller, which is a computer control system, that controls other devices based on various information available to it. |
| Range Master | The person in charge of any given session. |
| Stage | A step in the Course (of Fire). |



| SYMBOL | DEFINITION |
|---|---|
|  | Power (On/Off). |
|  | Ethernet LED. Will light steady when an active Ethernet connection is made and flash when there is activity. |
|  | Signal Strength. |
|  | Caution. |
|  | Risk of Electrical Shock. |
|  | Risk of Hot Surface. |
|  | Grounding Point/Terminal. |
|  | Ethernet POE Port. Do not plug non-POE powered devices into this port on the POE Injectors. |

THE PINNACLE OF SHOOTING RANGES™