COMMAND FURY™

spireOS™

OPERATION/MAINTENANCE MANUAL

1 800 761 1231

COMMAND FURY™

spireOS™

OPERATIONS/MAINTENANCE MANUAL

Version 2.2 | Spire Ranges © 2024

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.

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COMMAND FURY INTRODUCTION

The Command Fury is a stationary, ground mounted, turning target system that is ideal for any range's customized training programs and courses of fire. Electric-powered actuators quickly and quietly turn targets 90, 180 and 360° with random edging and friend/foe presentation. Targets can be controlled individually, or synchronized with a Spire master control touch screen and/or wireless remote. The Fury system is all-weather rated and proven durable, making it an ideal target system for all types of facilities and organizations, including law enforcement, military, government, commercial and indoor/outdoor ranges.

MASTER CONTROL CONSOLE OVERVIEW

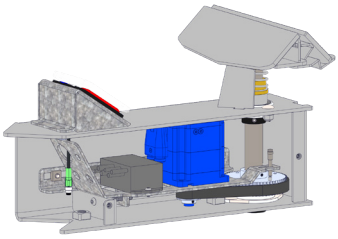
The Master Control Console allows a range master to manually control drills for an individual position or for all of the positions simultaneously on the range. As an option, a phone app allows for the rangemaster to control the system from the firing line. Additionally, an optional wireless remote allows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

IMPORTANT SAFETY INFORMATION

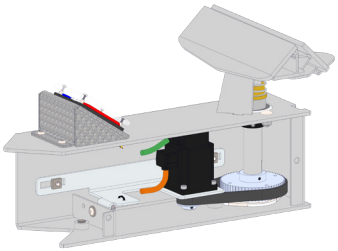
Maintenance and use must adhere to the guidelines in this manual. Improper use of any of the equipment can result in poor performance, product damage and even serious physical injury. Properly trained personnel should only operate the equipment within the range. For technical, mechanical and electrical 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, and eye trauma.

WHAT VERSION OF TARGET SYSTEM DO I HAVE?

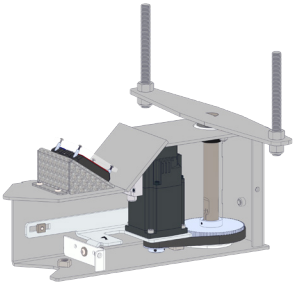
As technology and customer requests have evolved, our system has been updated. Our Fury system has gone through two iterations with an additional foam backer option. As a general rule, systems installed before January 2021 are Nanotec systems. Systems installed after that are Siemens systems. The following pictures can be used to help determine what type of system you have in your range.



Nanotec



Siemens (Standard)



Siemens (Foam Backer)

WARRANTY OF EQUIPMENT

Refer to agreement documents for specific warranty details for your range. Consumables, negligence, and improper use of equipment (including firing armor-piercing rounds or calibers not approved for your range's ballistic rating) are excluded from all warranties.

All products provided and installed by Spire Ranges are warranted against defects in material or workmanship under normal use and service, subject to limitations detailed below. Warranty period begins at the conclusion of the original installation.

This warranty applies to the original installation only. This warranty does not cover damages caused by improper installation, misuse, or lack of proper maintenance. This warranty does not cover damages caused by alterations or 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.

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. Return shipping to the site is covered by Spire Ranges during the warranty period. 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.

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

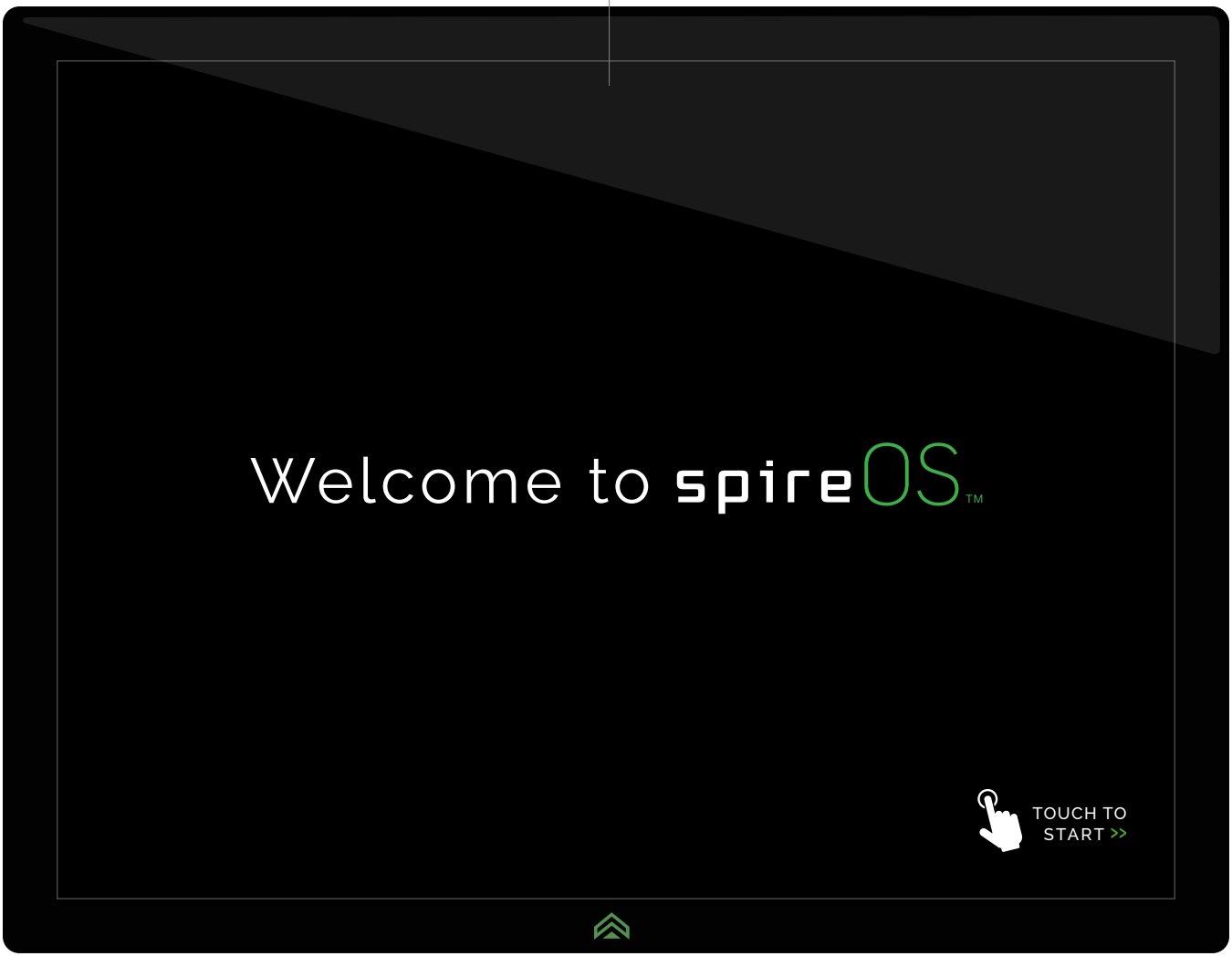
Neither Spire Ranges, nor any company affiliated with it, makes any warranties, representations or promise as to the performance or quality of the product other than what is specified in the original agreement between Spire Ranges and the range Owner. The liability of Spire Ranges to the Owner for damages 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.

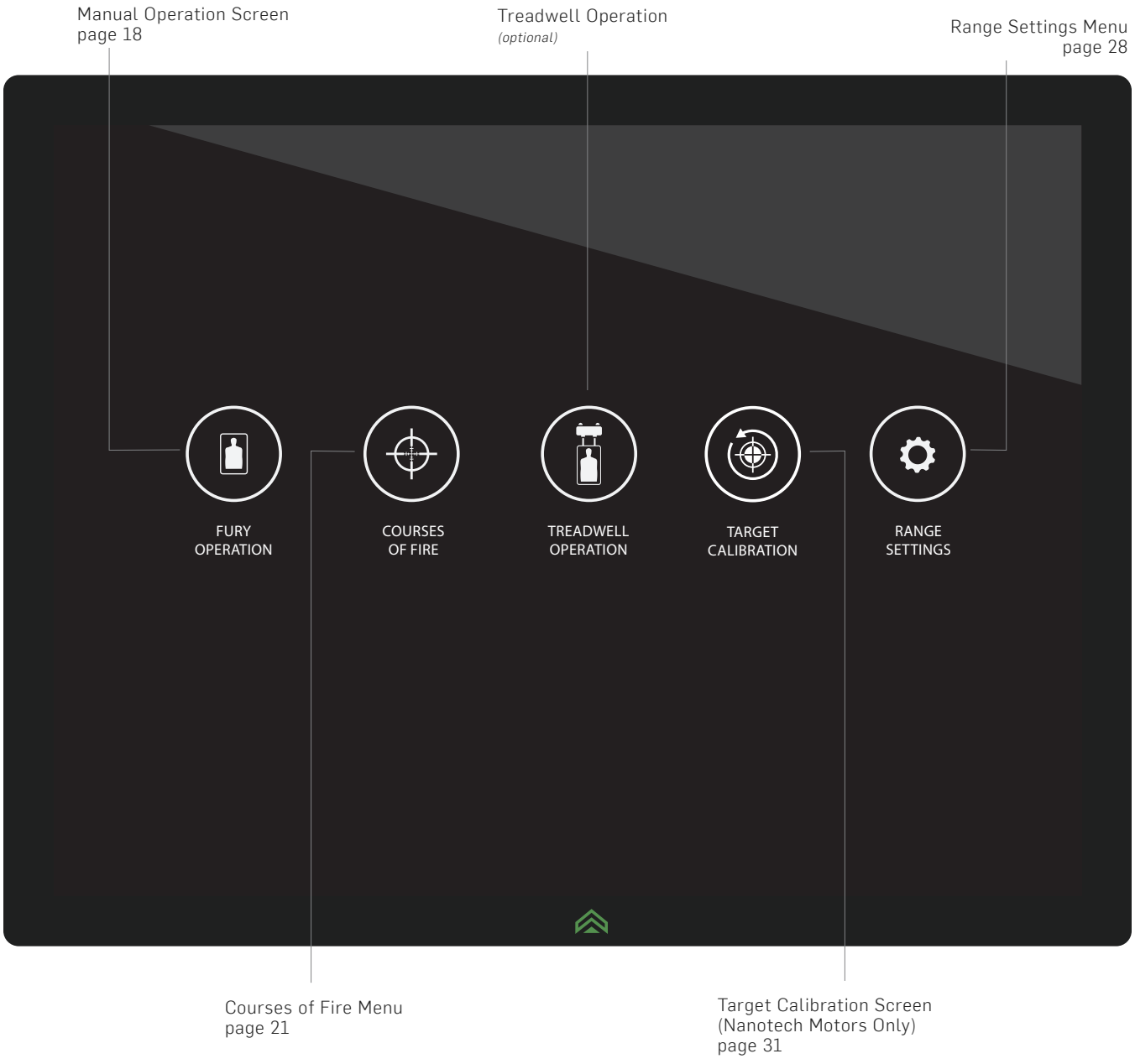
No representative of Spire Ranges has the authority to make any representation or promise on behalf of Spire Ranges or to alter or modify the terms or limitations of warranties in any way.

MASTER CONTROLS:

NAVIGATION

Start by touching anywhere

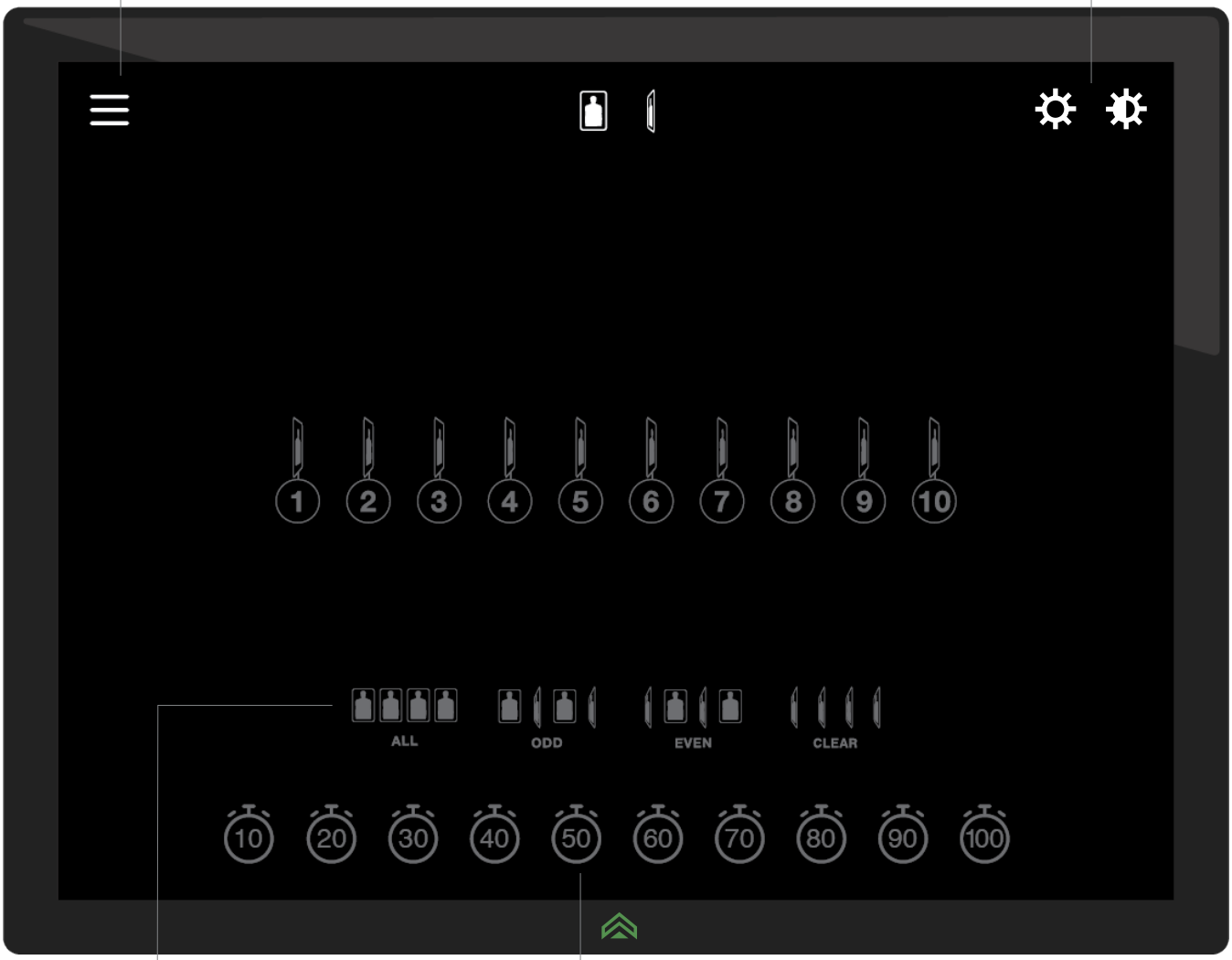



Manual Operation Screen
page 18
Treadwell Operation
(optional)
Range Settings Menu
page 28
FURY
OPERATION
COURSES
OF FIRE
TREADWELL
OPERATION
TARGET
CALIBRATION
RANGE
SETTINGS
Courses of Fire Menu
page 21
Target Calibration Screen
(Nanotech Motors Only)
page 31

MANUAL SESSION

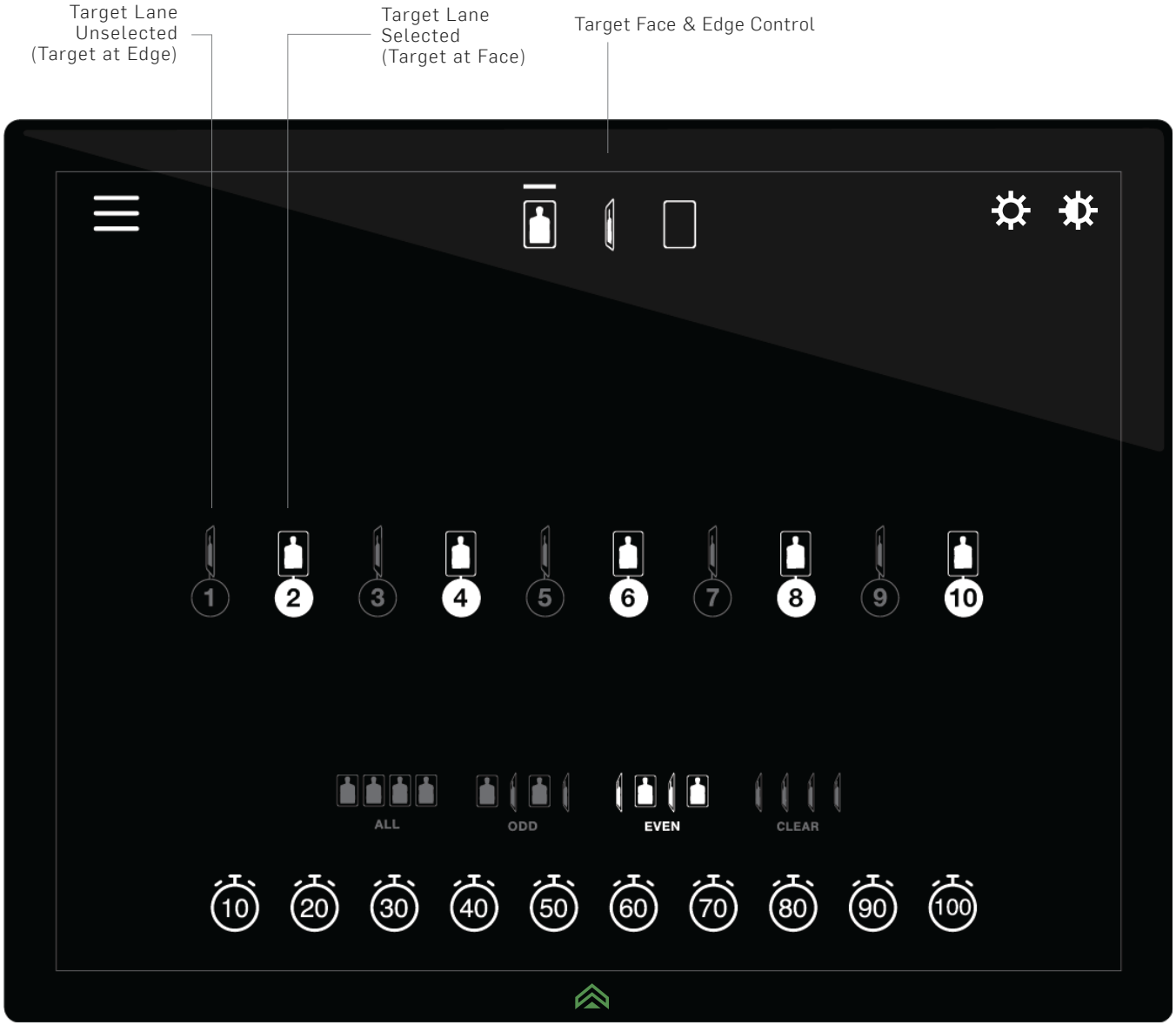
Back to Main Menu
page 15

Lights Control



Multilane Quick Selection:
All, Odd, Even, or Clear

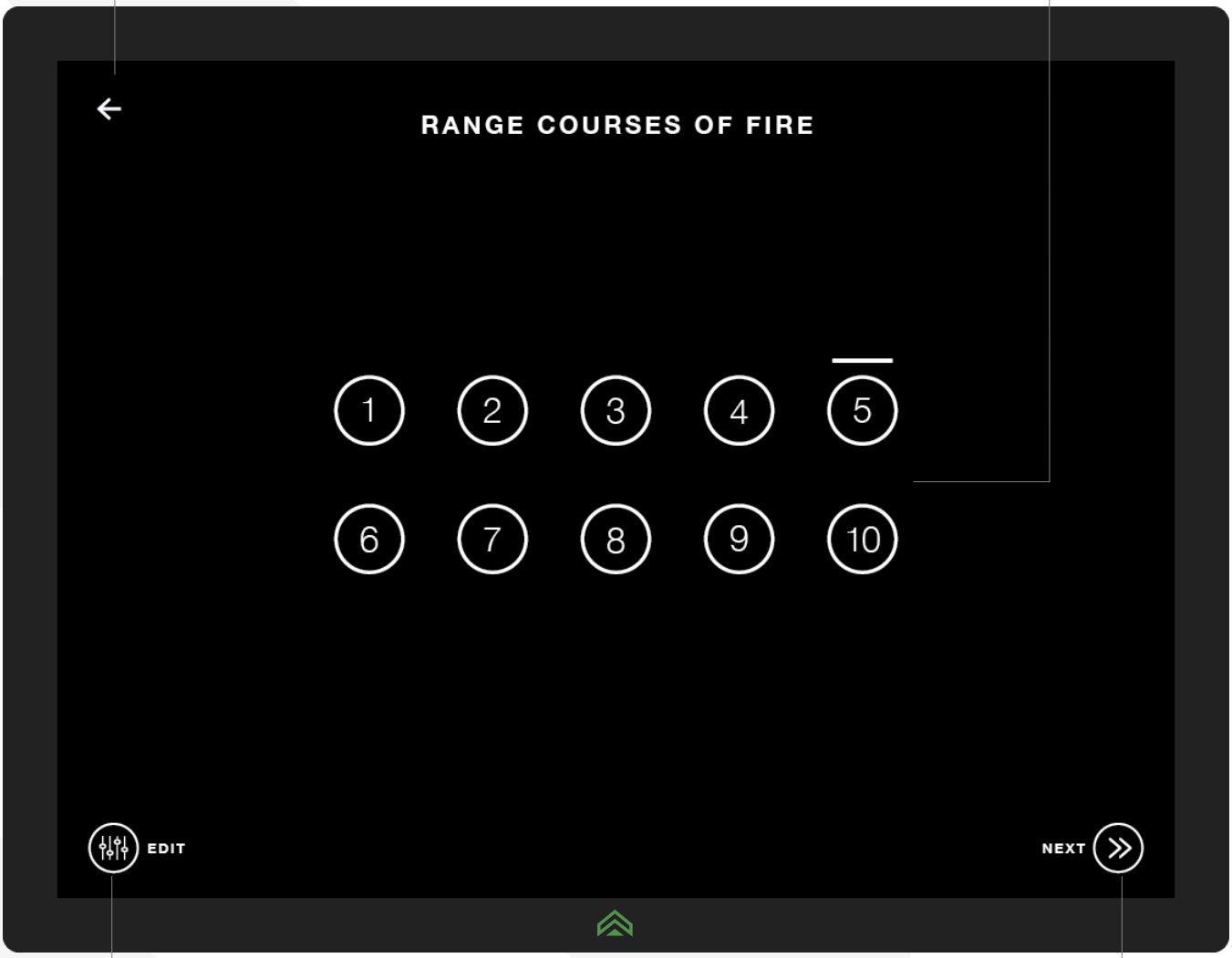
10 Preset Times
[Indicator will tick down and turn grey upon countdown completion.]


Target Lane Unselected (Target at Edge)
Target Lane Selected (Target at Face)
Target Face & Edge Control
1
2
3
4
5
6
7
8
9
10
ALL
ODD
EVEN
CLEAR
10
20
30
40
50
60
70
80
90
100

COURSE OF FIRE SESSION

Back to Main Menu
page 15

10 Courses of Fire set by the Range Master
[Course 5 is selected]

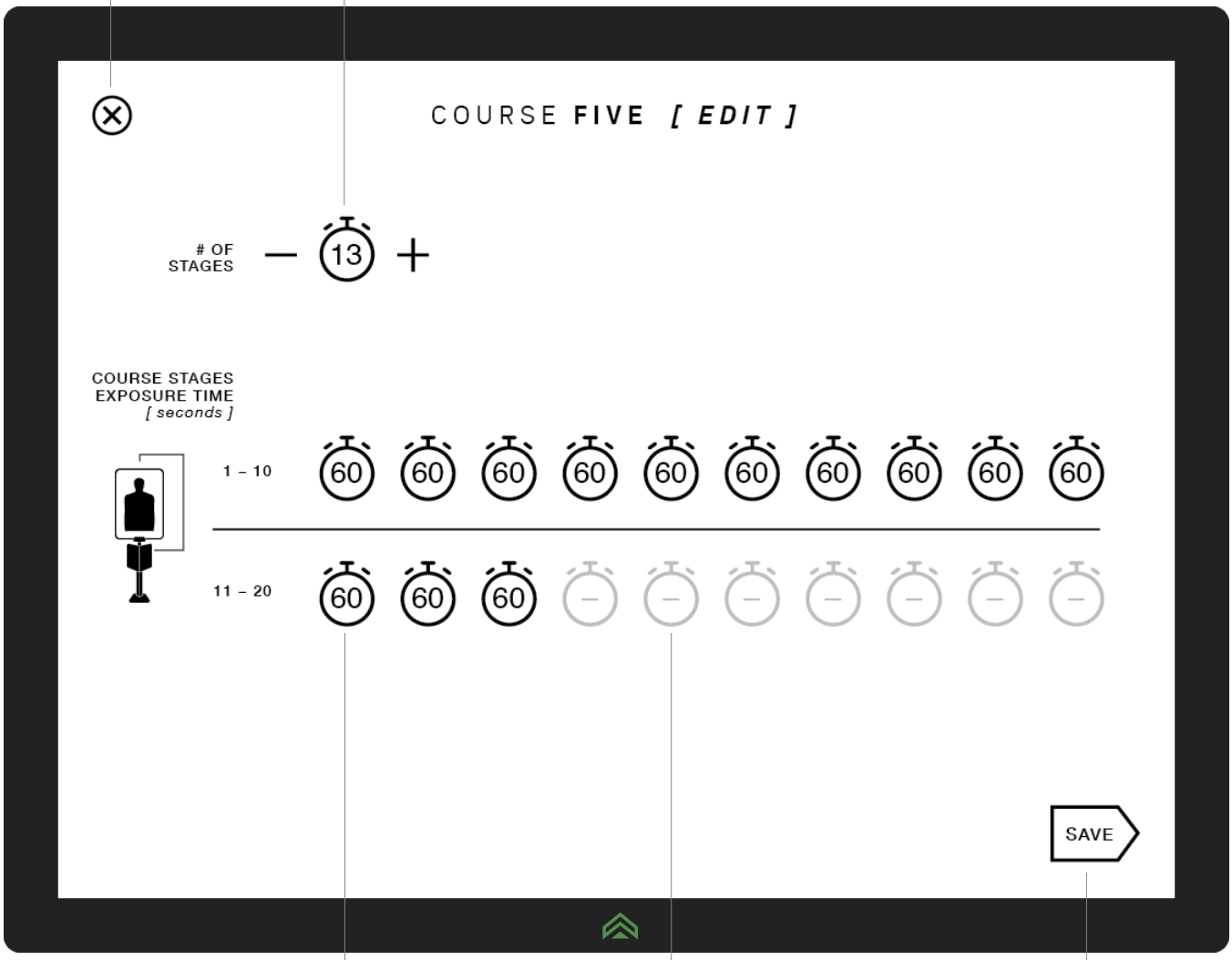


Edit Selected Course of Fire
page 22

Navigation to Target Selection for selected course of fire
page 23

Back to Courses of Fire Menu
page 21

Increase or decrease the number of active stages for the course of fire



Active Times

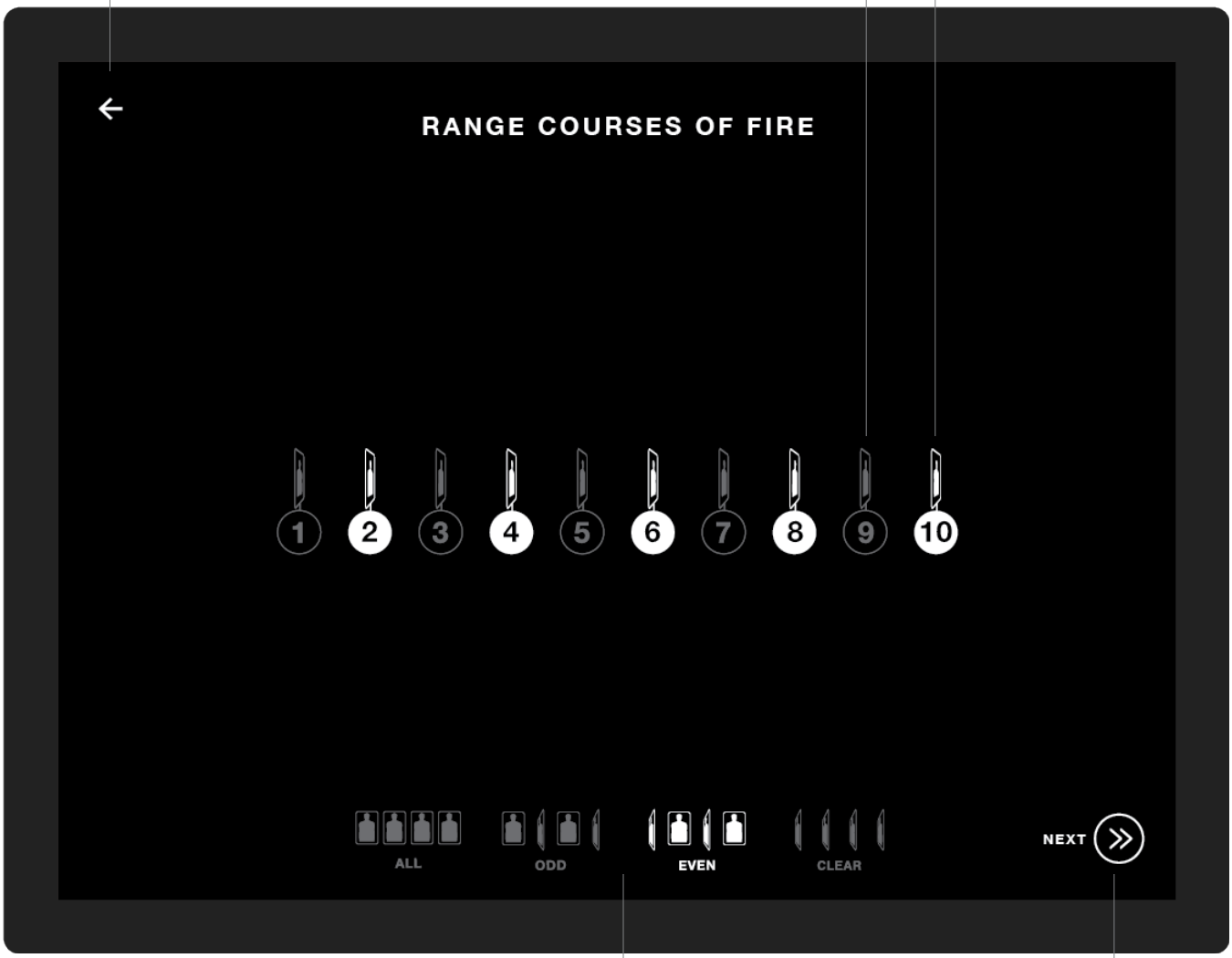
Inactive Times

Save & Return to Courses of Fire Menu
page 21

Back to Courses of Fire Menu
page 21

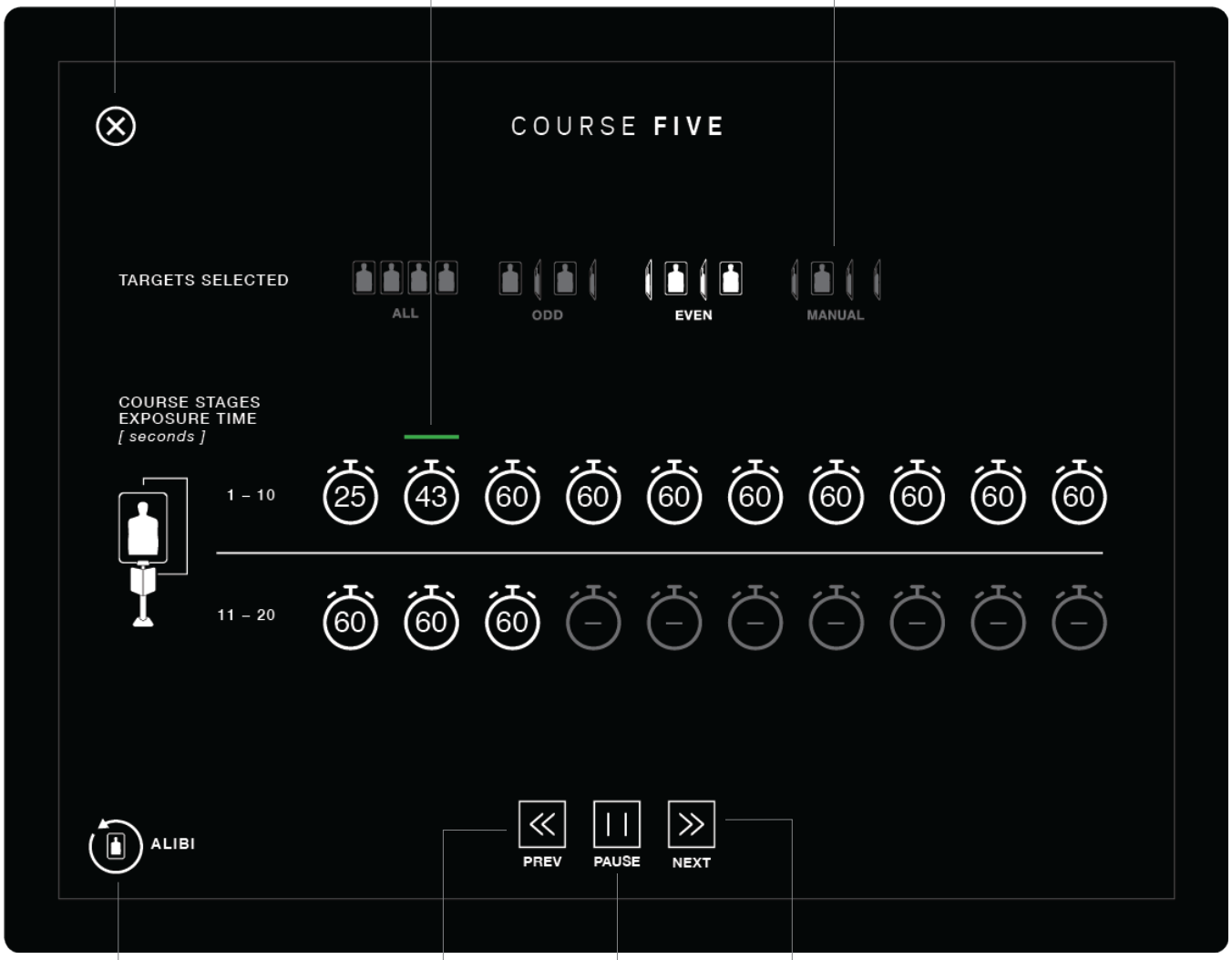
Target Lane Not Selected

Target Lane Selected

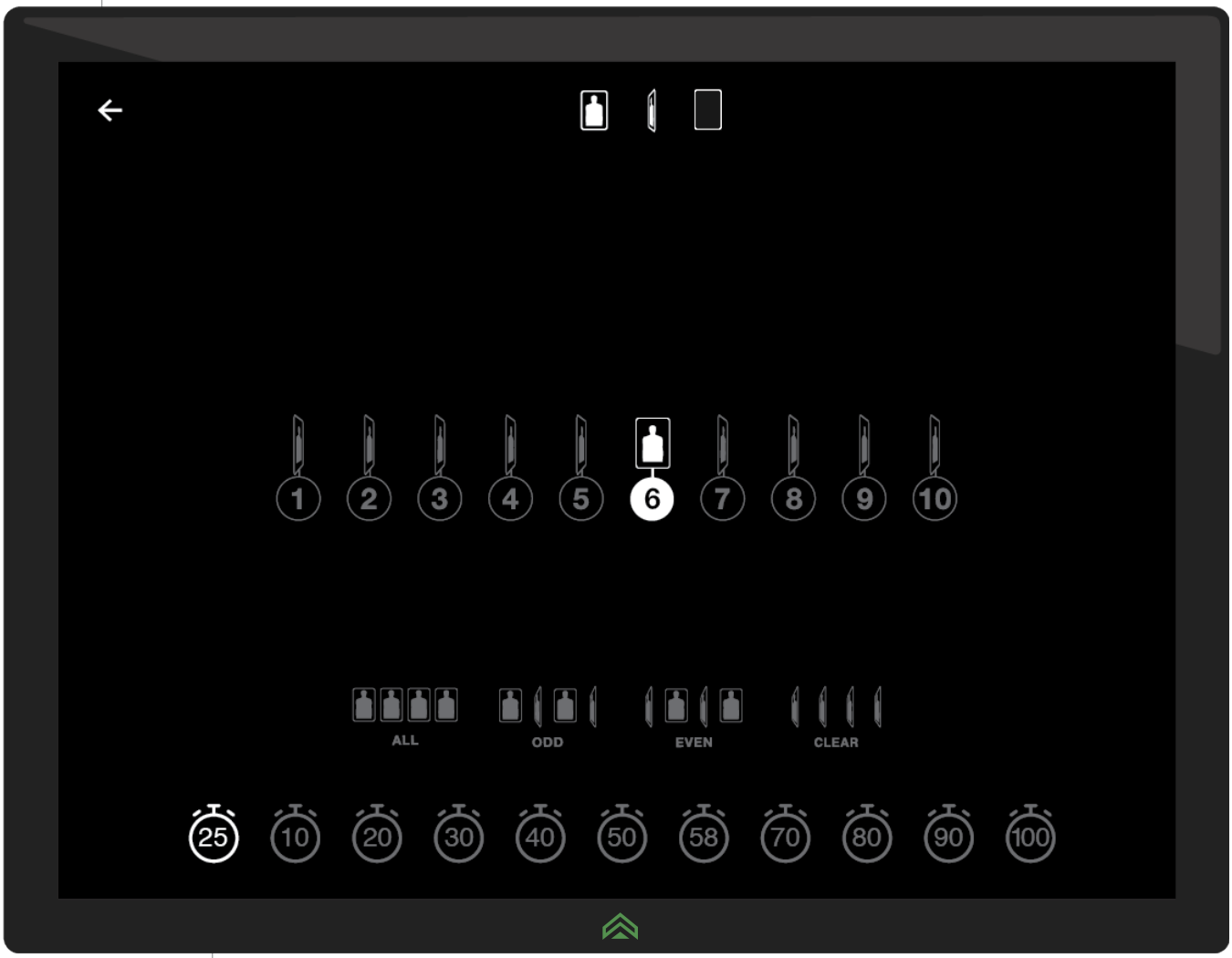


Multilane Quick Selection: All, Odd, Even, or Clear
[Even targets are selected.]

Navigation to Course In Play
page 24

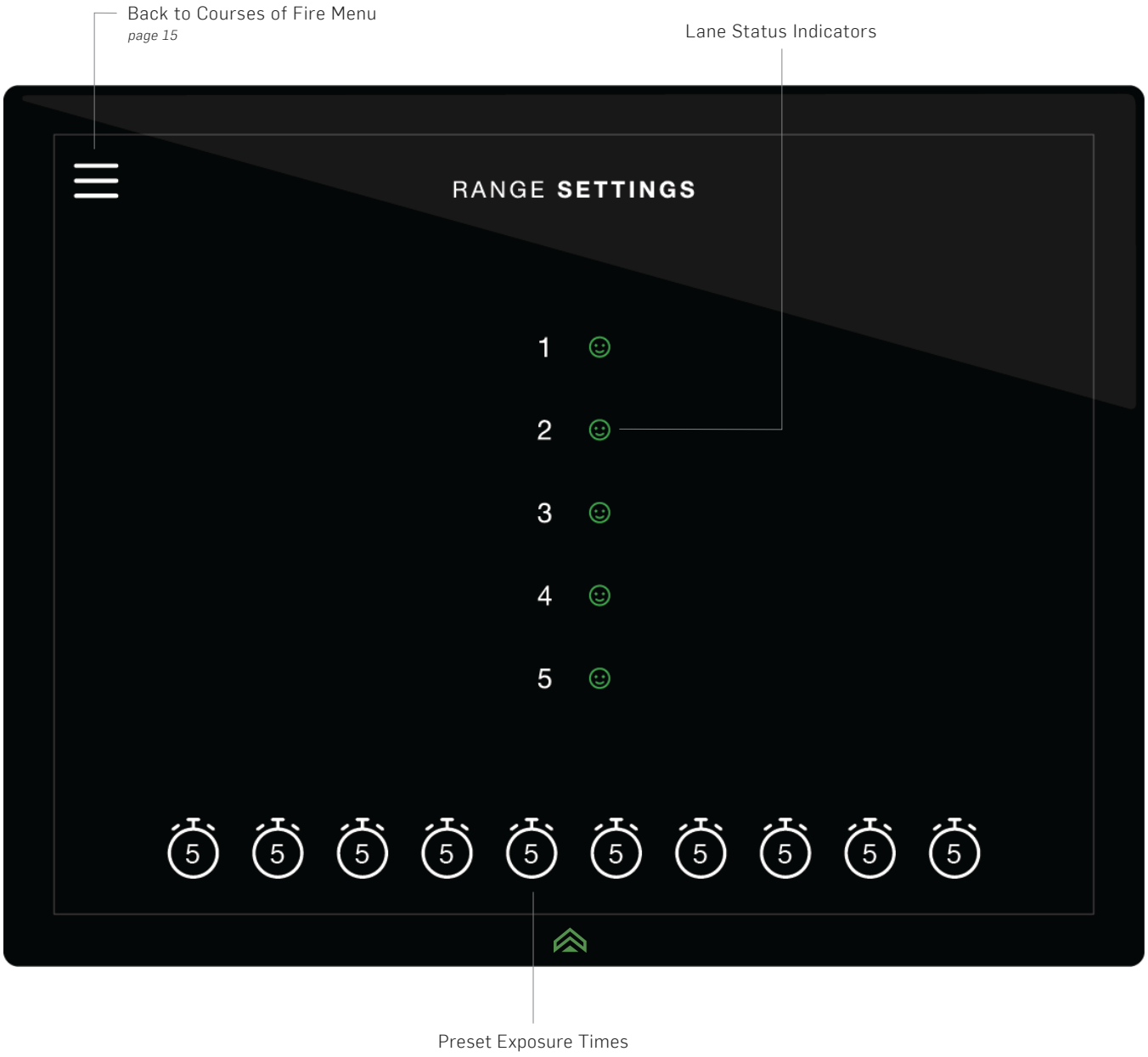

Back to Courses of Fire Menu
page 21
Current Stage
[Stage 2 is indicated.]
Selected Targets Indicators
[Even group is indicated.]
COURSE FIVE
TARGETS SELECTED
ALL
ODD
EVEN
MANUAL
COURSE STAGES EXPOSURE TIME
[seconds]
1 – 10
25
43
60
60
60
60
60
60
60
60
11 – 20
60
60
60
–
–
–
–
–
–
–
ALIBI
PREV
PAUSE
NEXT
Alibi Screen
page 25
Previous Stage
Pause/Start Stage
Next Stage

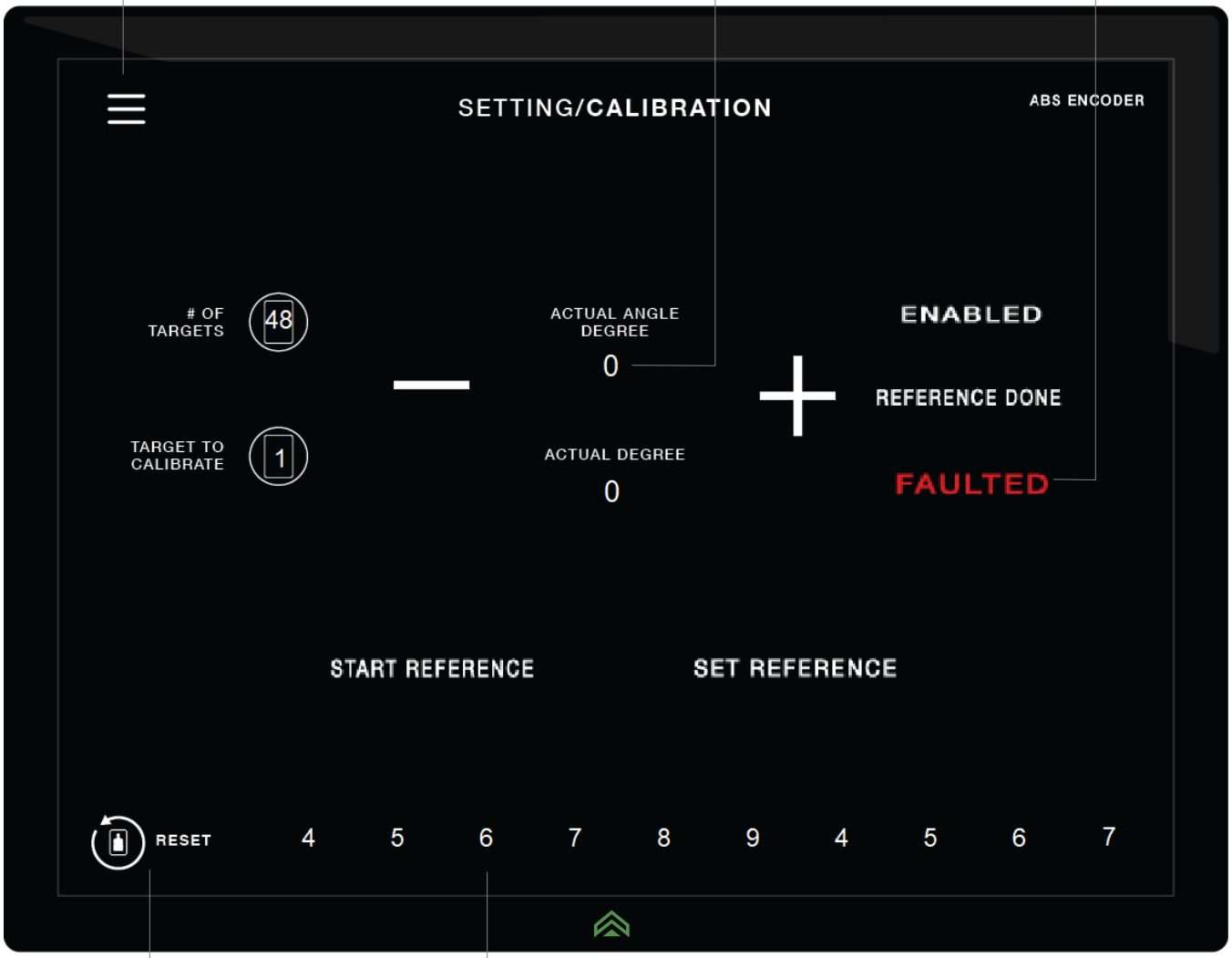
Back to In Play
page 24

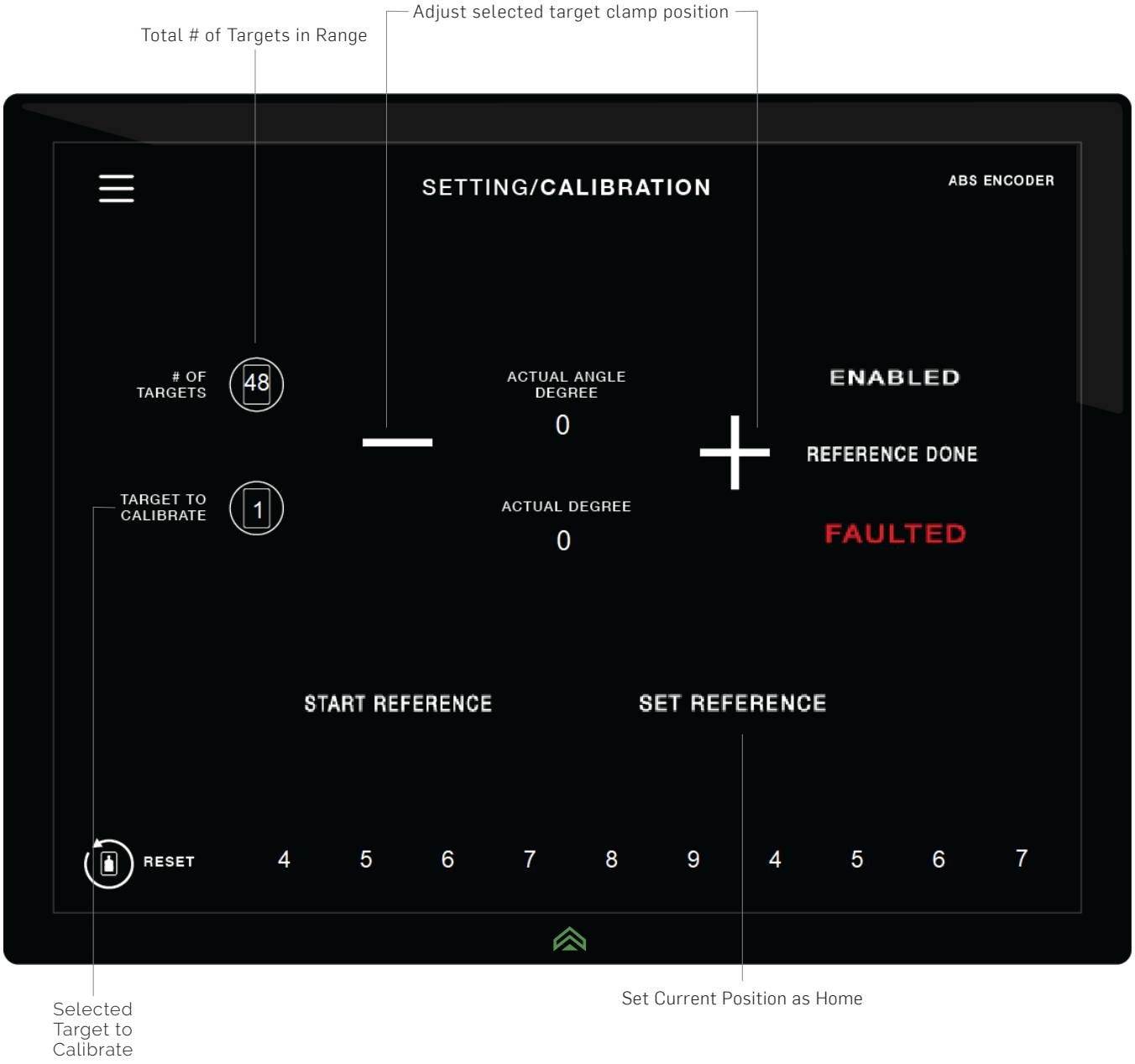


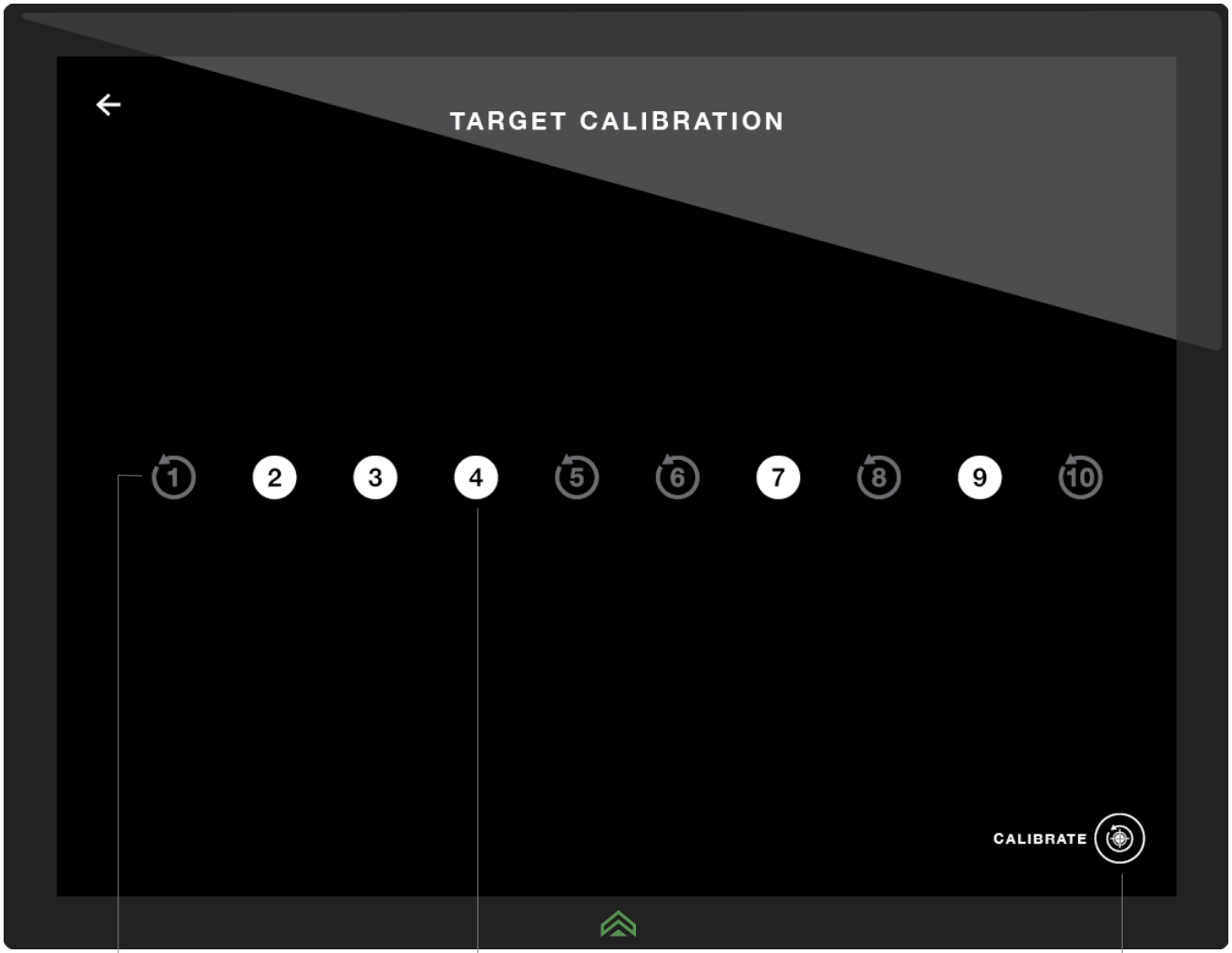
Time is automatically loaded
from the last stage completed.

FURY CONFIGURATION


Back to Courses of Fire Menu
page 15
Lane Status Indicators
RANGE SETTINGS
1
2
3
4
5
5 5 5 5 5 5 5 5 5 5
Preset Exposure Times


Back to Courses of Fire Menu
page 15
Target Position (0 or 360 is Home)
Lane Status
SETTING/CALIBRATION
ABS ENCODER
OF TARGETS
48
TARGET TO CALIBRATE
1
ACTUAL ANGLE DEGREE
0
ACTUAL DEGREE
0
ENABLED
REFERENCE DONE
FAULTED
START REFERENCE
SET REFERENCE
RESET
4 5 6 7 8 9 4 5 6 7
Reset all Target Faults
Preset Exposure Times


Total # of Targets in Range
Adjust selected target clamp position
SETTING/CALIBRATION
ABS ENCODER
OF TARGETS
48
ACTUAL ANGLE DEGREE
0
ENABLED
REFERENCE DONE
TARGET TO CALIBRATE
1
ACTUAL DEGREE
0
FAULTED
START REFERENCE
SET REFERENCE
RESET
4 5 6 7 8 9 4 5 6 7
Selected Target to Calibrate
Set Current Position as Home


TARGET CALIBRATION
1
2
3
4
5
6
7
8
9
10
CALIBRATE
Unselected target carrier to calibrate
Selected target carrier to calibrate
Calibrates selected targets

MOBILE CONTROLS:

[1] Download cMT Viewer App for the device.

GET IT ON Google Play

Download on the App Store

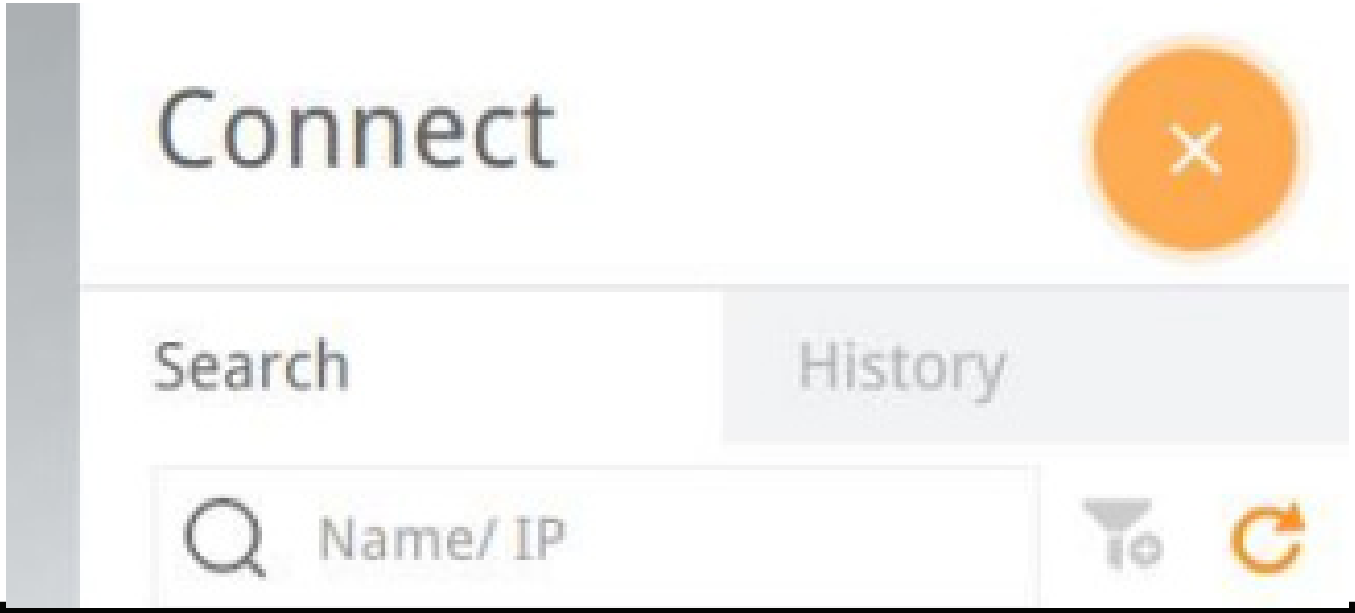
Windows

[2] Connect to the range WiFi.

- WiFi: RangeAccess
- Password: spireranges

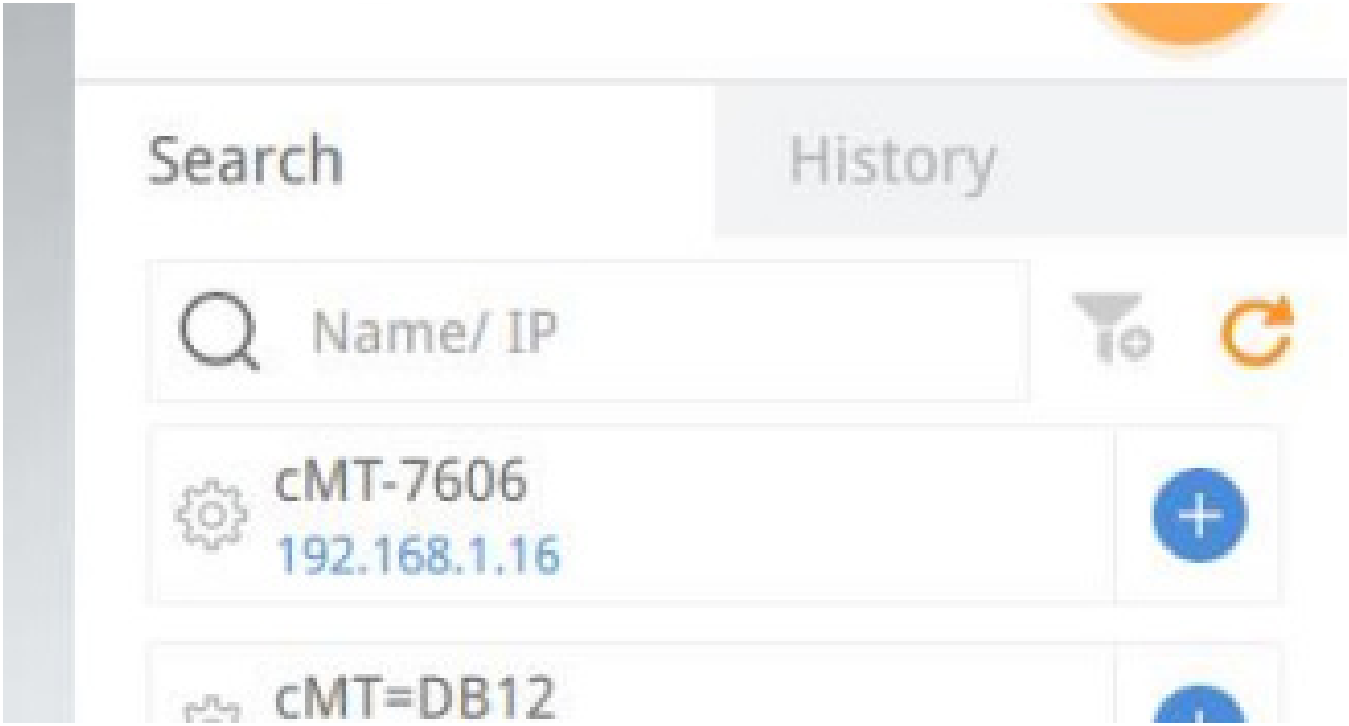
[3] Open cMT Viewer.

[4] Press the orange "+" at the top of the screen.



[5] The program should appear. Generally it will have the address of 192.168.1.61. Press the "+" button to add the program. Password is 111111 (six 1's).

- If the program does not appear automatically, try pressing the orange reload button.
- If it still does not appear, try typing 192.168.1.61 into the Name/IP field.
- **Note:** Generally the IP address for your range will be 192.168.1.61 as mentioned above. But, some ranges are unique and will have a different address. This is especially common when there are multiple bays in your range and each bay has a different master control. In that case, try the following addresses:
  - Bay 1: 192.168.1.61
  - Bay 2: 192.168.1.62
  - Bay 3: 192.168.1.63
  - etc.
- If those do not work, contact Spire.
- **Note:** If the Master Control screen is not working, then the app will generally not work either. Generally the app gets its program from the master screen.



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

FURY COMPONENTS:

CODE	DESCRIPTION	PRT #	QTY
1	FURY STAND - WELDMENT	FBW-7400-203	1
2	***FURY BALLISTIC SHIELD - WELDMENT	FBW-7400-204	1
3	***FURY TARGET HOOP ASSEMBLY - WELDMENT	FBW-7400-205 (STANDARD) FRK-7073-900 (FOAM BACKER)	1
4	FURY HOGAN HOUSE ASSEMBLY	FRA-7400-105	1
4.01(N)	FURY HOGAN HOUSE - WELDMENT (STANDARD)	FBW-7400-200-ZN	1
4.01(FB)	FURY HOGAN HOUSE - WELDMENT (FOAM BACKER)	FBW-7405-200-ZN	1
4.02(N)	***FURY TURNING CLAMP - WELDMENT (STANDARD)	FBW-7400-201	1
4.02(FB)	***FURY TURNING CLAMP - WELDMENT (FOAM BACKER)	FRK-7073-200	1
4.03	***FURY CLAMP FLOATING JAW - WELDMENT	FBW-7400-202	1
4.04(N)	FURY LIGHT KIT - NANOTECH	FRK-7400-702	1
4.04(S)	FURY LIGHT KIT- SIEMENS	FRK-7400-903	1
4.05(N)	NANOTECH SERVO MOTOR	ESM-3414-PD6S	1
4.05(S)	STANDARD SIEMENS SERVO MOTOR	ESM-1FL6032-2AF	1
4.05(FB)	FOAM BACKER SIEMENS SERVO MOTOR	ESM-1FL6044-2AF	1
4.06(N)	FURY HOUSING SIDE COVER (STANDARD)	FBP-7072-004-ZN	1
4.06(FB)	FURY HOUSING SIDE COVER (FOAM BACKER)	FBP-7075-005-ZN	1
4.07	FURY LED MODULE BRACKET	FBP-7072-201	1

** Indicates recommended replacement parts. (See page 54 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 #	QTY
4.08	TACTICAL LIGHT LEXAN COVER	FBP-7072-202	1
4.09(N)	FURY MOTOR BRACKET - NANOTECH	FRP-7401-001	1
4.09(S)	FURY MOTOR BRACKET - SIEMENS	FRP-7401-003	1
4.09(FB)	FURY MOTOR BRACKET - SIEMENS FOAM BACKER	FRP-7075-006	1
4.10	#06-32 X 3/8" BUTTON HEAD SCREW-SS	HBH-0632-038-SS	6
4.11	1/4"-20 X 5/8" BUTTON HEAD SCREW-SS	HBH-25020-063-SS	6
4.12	1/4"-20 X 1-1/2" BUTTON HEAD SCREW-SS	HBH-25020-150-SS	1
4.13	1" BORE SPLIT FLANGE BEARING	HBR-SFL205-016	2
4.14	5/16"-18 X 3/4" CARRIAGE BOLT-SS	HCB-31318-075-SS	4
4.15(N)	425MM X 5M15 DRIVE GEAR BELT (STANDARD)	HDB-5M15-425	1
4.15(FB)	475MM X 5M15 DRIVE GEAR BELT (FOAM BACKER)	HDB-5M15-475	1
4.16(N)	1.0-KEY X 5M15 DRIVE GEAR PULLEY- 60T (STANDARD)	HDG-5M15-100K	1
4.16(FB)	1.0-KEY X 5M15 DRIVE GEAR PULLEY- 72T (FOAM BACKER)	HDG-100K-5M15-072	1
4.17(N)	14MM X 5M15 X 20T DRIVE GEAR (STANDARD)	HDG-5M15-14M	1
4.17(FB)	3/4" X 5M15 X 26T DRIVE GEAR (FOAM BACKER)	HDG-075-5M15-026	1
4.18	1" X 1-3/8" X 1-5/8" FLANGE SLEEVE-BRNZ	HFB-100138-163	2
4.19	1" X 1-1/2" X 5/8" SOLID LOCK COLLAR	HLC-100150-063	1

** Indicates recommended replacement parts. (See page 54 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 #	QTY
4.20	1/4"-20 NYLOCK NUT-ZN	HLN-25020-005-ZN	2
4.21	5/16"-18 NYLOCK NUT-ZN	HLN-31318-005-ZN	4
4.22	1/4" UNDERSIZED MACHINE KEY-SS	HMK-250UB-100-SS	1
4.23	M5-0.8 X 12MM SOCKET CAP SCREW-SS	HSH-05M08-012-SS	4
4.24	#6-32 MF X 3/8" X 3/16" HEX STAND-OFF	HSO-0632-038	4
4.25	1-3/8" X 1.60 X 2" COIL SPRING	HSP-138160-200	1
4.26	1/4"-20 X 3/8" CUP SET SCREW-SS	HSS-25020-38-SS	2
4.27	1/4"-20 X 5/16" SLOT X 1/4" TEE NUT	HTN-25020-313-BP	2
4.28	1/4" X 3/4" X .060 FLAT WASHER-ZN	HWS-250750-060ZN	1
4.29	4"-18LB ZIP TIE(SMALL TIE)	HZT-0625-040	1
430(N)	NANOTECH MOTOR POWER CABLE	ELEWR-SJOOW-163	1
4.30(S)	SIEMENS MOTOR POWER CABLE	ELE-25CK-011	1
4.31(N)	NANOTECH MOTOR SIGNAL CABLE	ELE-P5M12-05M	1
4.31(S)	SIEMENS MOTOR SIGNAL CABLE	ELE-25DB-201	1
4.32	CONTROL HARNESS (NANOTECH)	ELE-8085-102	1
4.33	#10-32 X 3/8" BUTTON HEAD SCREW - SS	HBH-1032-038-SS	2
4.34	POWER CONNECTOR (NANOTECH)	ELE-87516-3P	1

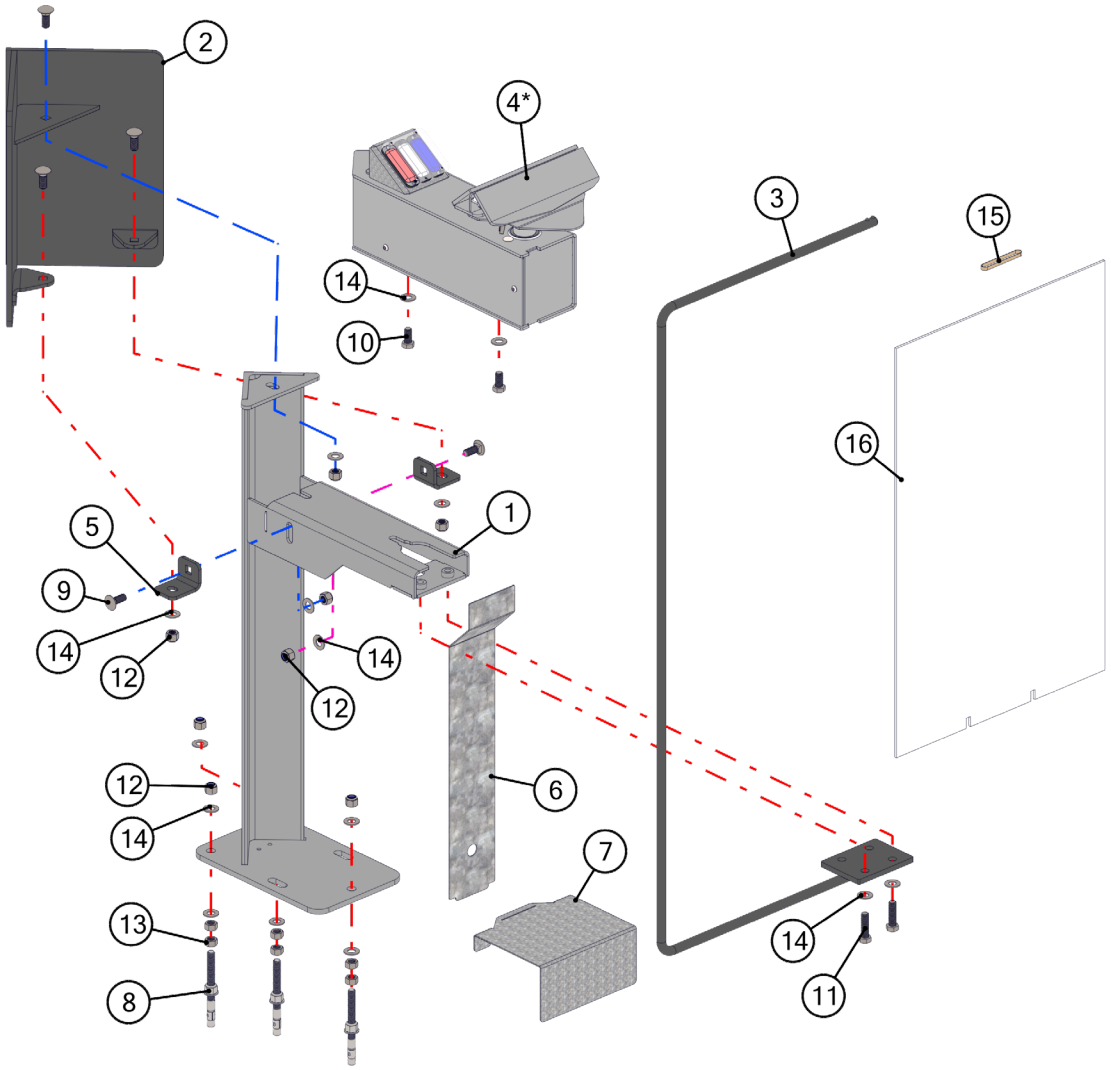
** Indicates recommended replacement parts. (See page 54 for more information)

*** 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 #	QTY
4.35	DOWEL PIN	HBP-188QG-100	1
4.36	M5 X 45MM PROXIMITY SENSOR	EPX-05045-005	1
5	FURY BALLISTIC SHEILD MOUNTING BRKT	FBP-7072-605	2
6	FURY STAND LEG COVER	FBP-7472-507 (4" RACEWAY) FBP-7471-507 (2" RACEWAY)	1
7	FURY RACEWAY STAND CAP	FBP-7472-508 (4" RACEWAY) FBP-7471-508 (2" RACEWAY)	1
8	1/2"-13 X 5-1/2" CONCRETE WEDGE ANCHOR	HAC-50013-550-ZN	3
9	1/2"-13 X 1-1/4" CARRIAGE BOLT-ZN	HCB-60013-125-ZN	5
10	1/2"-13 X 1" HEX BOLT-ZN	HHB-50013-100-ZN	2
11	1/2"-13 X 1-3/4" HEX BOLT-ZN	HHB-50013-175-ZN	2
12	1/2"-13 NYLOCK NUT-ZN	HLN-50013-005-ZN	8
13	1/2"-13 STANDARD NUT-ZN	HSN-50013-005-ZN	6
14	.500 X 1.06 X .07 FLAT WASHER-ZN	HWS-500106-070-ZN	15
15	***#64 RUBBER BAND-TAN	RBB-35025-064	1
16	***CORRUGATED CARDBOARD TARGET	TGT-001	1

** Indicates recommended replacement parts. (See page 54 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.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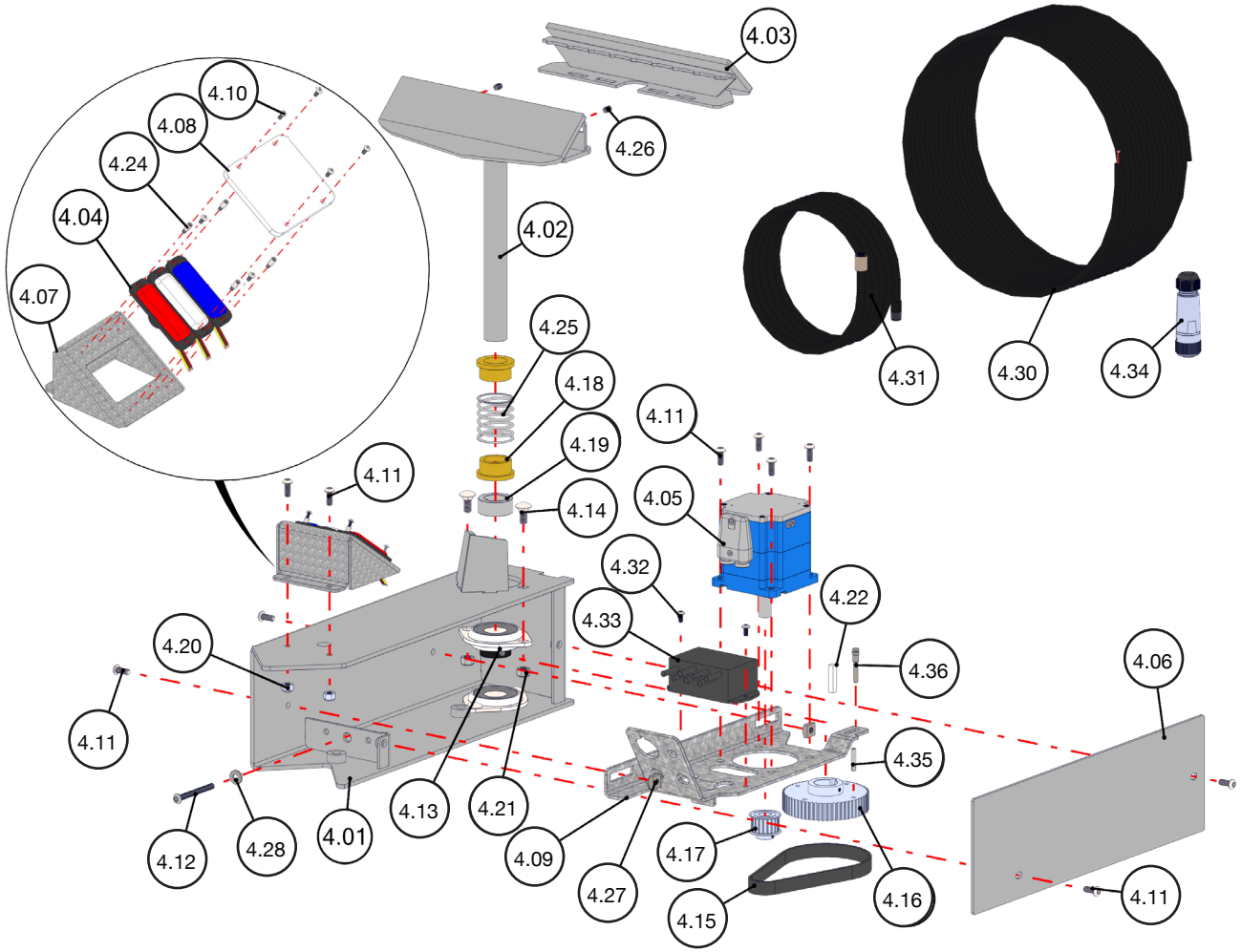
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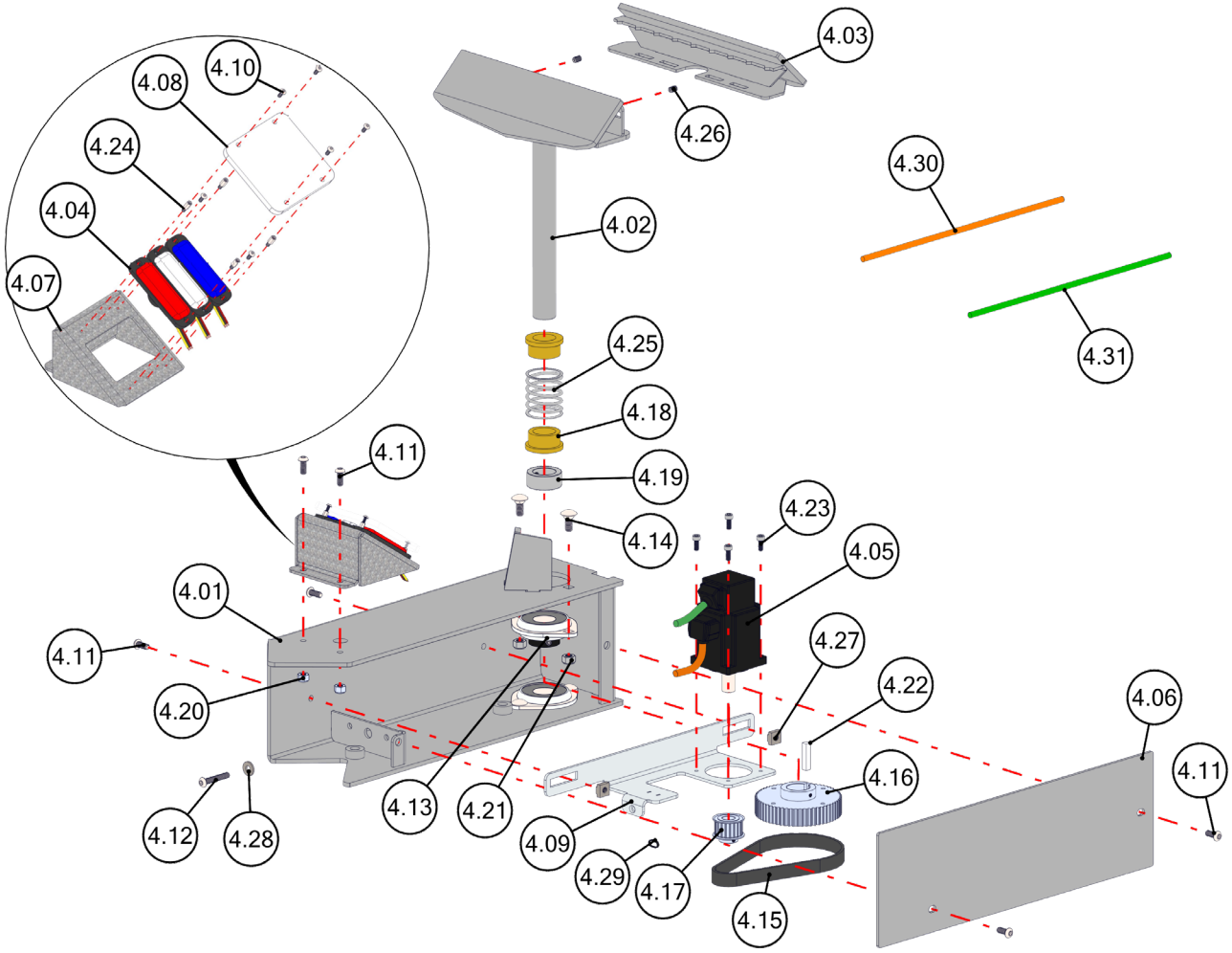
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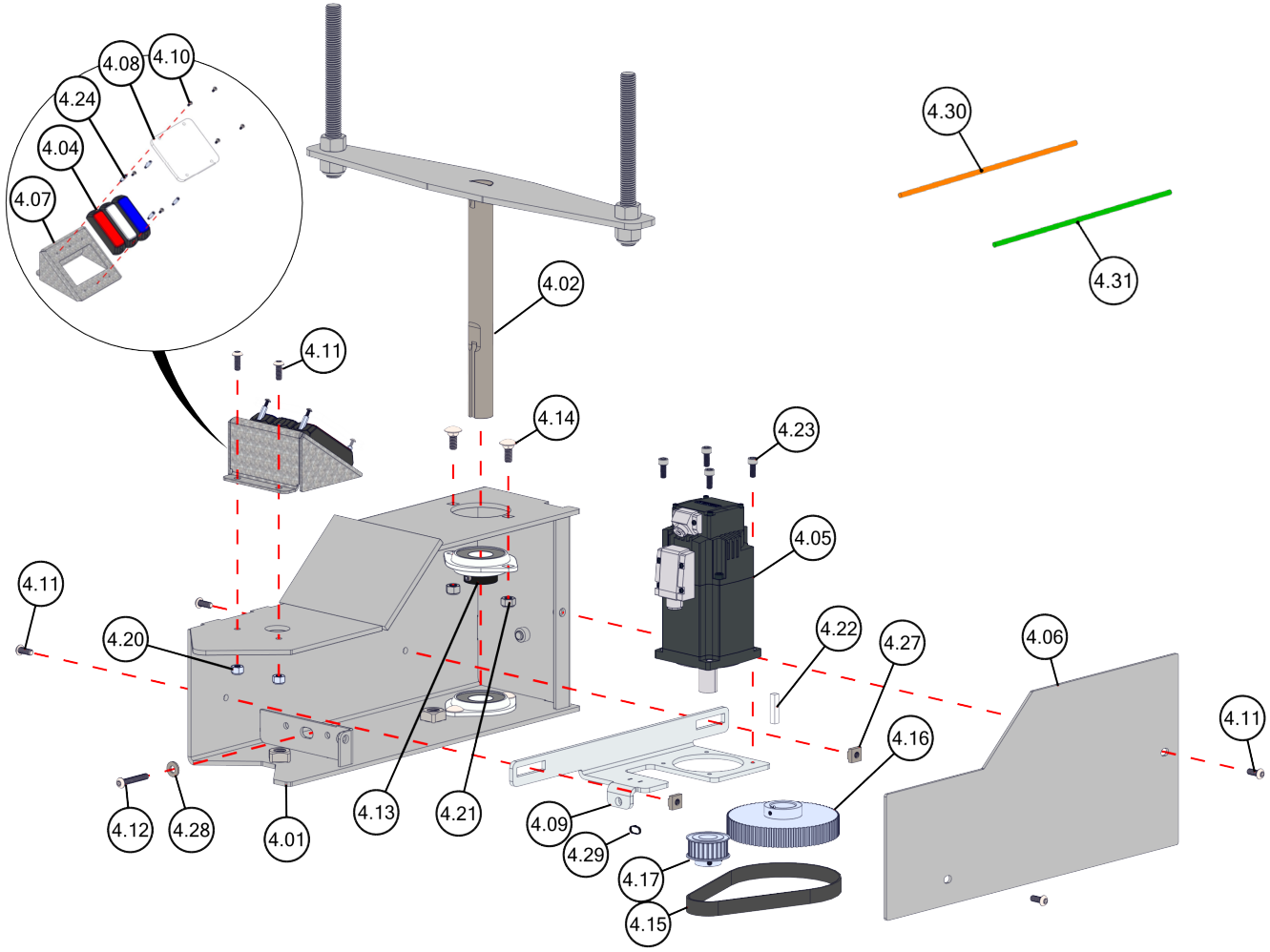
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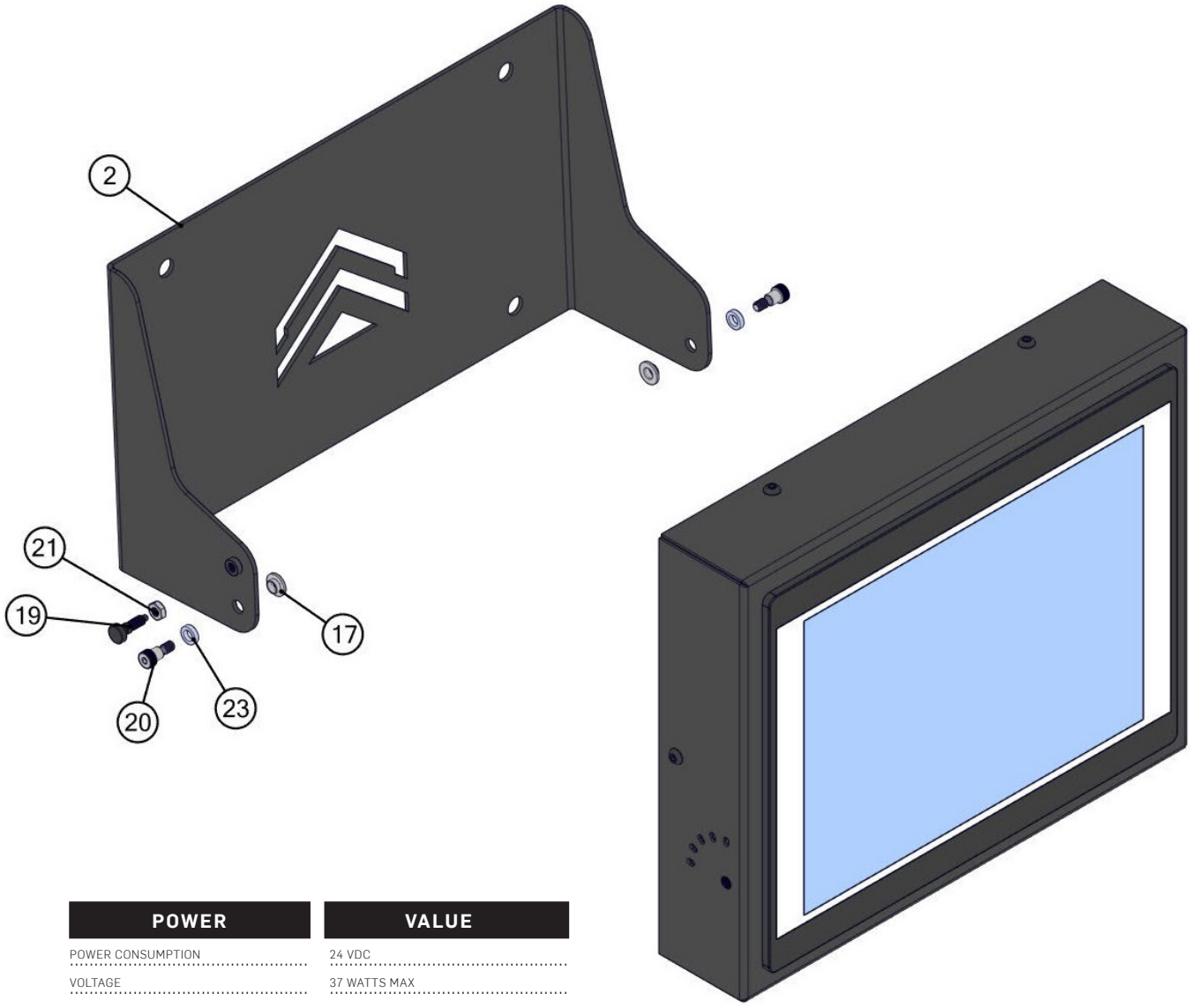
CODE	DESCRIPTION	PRT #	QTY
1	15" HMI HOUSING	CTP-7915-201	1
2	15" HMI MOUNTING PLATE	CTP-7915-203	1
3	15" HMI HOUSING BACK PLATE	CTP-7915-212	1
5	DOUBLE SIDED TAPE	DST-75003-300	2
7	POWER SWITCH	ELE-2032-030	1
8	RJ45 COUPLER	ELE-31C6-RJ45	1
14	24V POWER SUPPLY	ELE-6024-120	1
15	15" HMI	ELE-65150-CBK	1
16	1/4"-20X5/8" BUTTOH HEAD BLACK OXIDE	HBH-25020-063-BK	6
17	.313 x .620 x .060 INSUL WASHER-NY	HIW-313620-060-NY	2
19	1/4"-20X1/2" RETURN SPRING PLUNGER	HRS-25020-050	1
20	.313 x .313 x .250-20 SHSB	HSB-313313-25020	2
21	1/4"-20 JAM NUT- SS	HSN-25020-0014-SS	1
23	.340 x .740 x .060 WASHER-NY	HWS-317500-125-NY	2

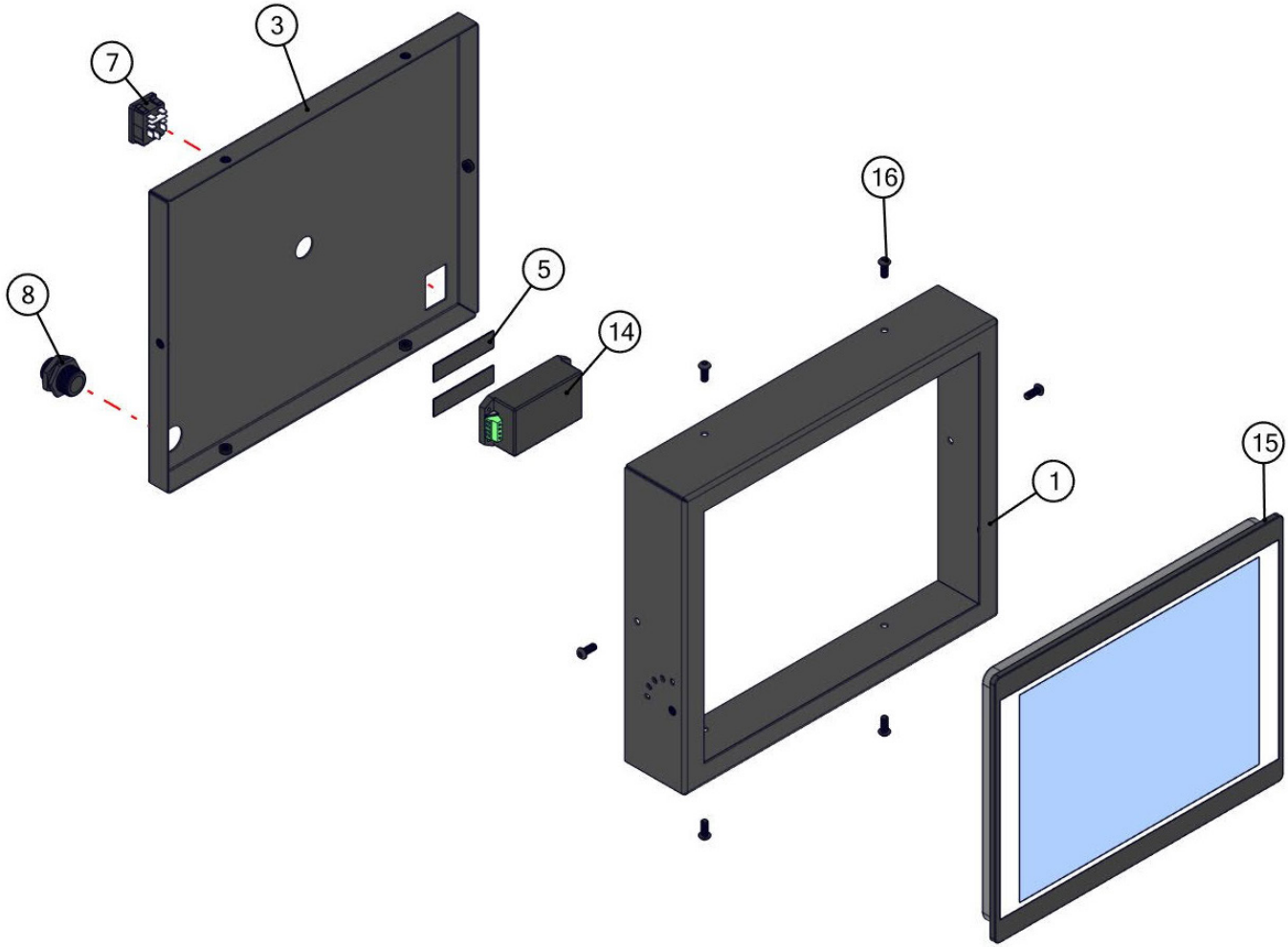
** Indicates recommended replacement parts. (See page 54 for more information)

*** 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	37 WATTS MAX

TEMPERATURE RATINGS	VALUE
OPERATING	0–55°C (32–131°F)
STORAGE	-25–75°C (-13–167°F)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MAINTENANCE:

ROUTINE MAINTENANCE

TIME TABLE	PROCEDURE
Weekly	1. Check each set screw to ensure they have remained tight. If they are loose, remove set screw and add a drop of low strength thread locker (purple) before re-tightening. 2. Lightly twist clamp with carrier turned on to ensure there is no movement or slip of the clamp to the shaft.
Monthly	1. Check all the screws and bolts on the Fury and the mounting assembly have remained tight. If any are loose, add blue Loctite and hand tighten. 2. Inspect wire raceways for evidence of rodents. If rodents have entered the system, plug any holes that they may be using to gain access. 3. Check belt tension. Belt should have 1/4" to 3/8" lateral deflection with minimal force applied.

TOOLS

LIST OF TOOLS

- 3/16" Wrench
- 5/64" Allen Wrench
- 1/8" Allen Wrench
- 5/32" Allen Wrech
- 2mm Allen Wrench
- 4mm Allen Wrench
- 7/16" Socket
- 1/2" Socket
- 3/4" Socket
- Socket Wrench
- Low Strength Purple Thread Locker
- Medium Strength Blue Thread Locker
- Mini Flathead Screwdriver
- Multimeter

RECOMMENDED REPLACEMENT PARTS

DESCRIPTION	PRT #	QTY
CLAMP	FBK-7400-906	1
CLAMP MOTOR	ESM-1FL6032-2AF (SIEMENS STANDARD) ESM-1FL6044-2AF (SIEMENS FOAM BACKER) ESM-3414-PD6S (NANOTECH)	1
FURY PLC	ELE-6005-630 (SIEMENS) ELE-6005-534 (NANOTECH)	1
FURY MOTOR DRIVE (SIEMENS MOTORS ONLY)***	ELE-7502-300 (SIEMENS STANDARD) ELE-7503-300 (SIEMENS FOAM BACKER)	1
FURY CLAMP BELT	HDB-5M15-425 (NANOTECH/SIEMENS STANDARD) HDB-5M15-475 (SIEMENS FOAM BACKER)	1
LEXAN LIGHT COVER	FBP-7072-202	2
HARDWARE REPLACEMENT KIT (Below items are included in kit)	FURY-HARDWARE-KIT	1
MOTOR GEAR SET SCREWS	HSS-01024-025-BK	10
CLAMP SHAFT GEAR SET SCREWS	HSS-01032-019-BK	10
CLAMP BEARING SET SCREWS	HSS-25028-025-SS	10
CLAMP GEAR KEY	HMK-250UB-150-SS	1
BUTTON HEADS	HBH-25020-063-SS	15
TEE NUT	HTN-25020-313-BP	5

*** 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.

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) Screen is in sleep mode	(1) Touch the screen to bring HMI out of sleep mode.
	(2) No power supplied to HMI	(1) Check the power supply connection. (2) If the 15" master, check the fuse on the back of the screen. (3) Check circuit breaker to see if tripped. (4) If problem persists, contact Spire for technical support.
1.2 Single Nonresponsive Button on Screen	(1) HMI screen error	(1) Check power supply to PLC. If PLC has power, cycle power to PLC. (2) If there is no indicator light for power to the PLC, check circuit breaker to see if tripped.
	(2) HMI calibration needed	(1) Power cycle the screen and (2) immediately touch the screen during startup. (3) Follow the on-screen prompts to calibrate.
	(3) HMI / PLC fault	(1) Contact Spire for technical support.
1.3 Entire HMI Touch Screen Nonresponsive	(1) HMI error	(1) Cycle power to HMI.
	(2) HMI / PLC fault	(2) Cycle power to the PLC.
1.4 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.

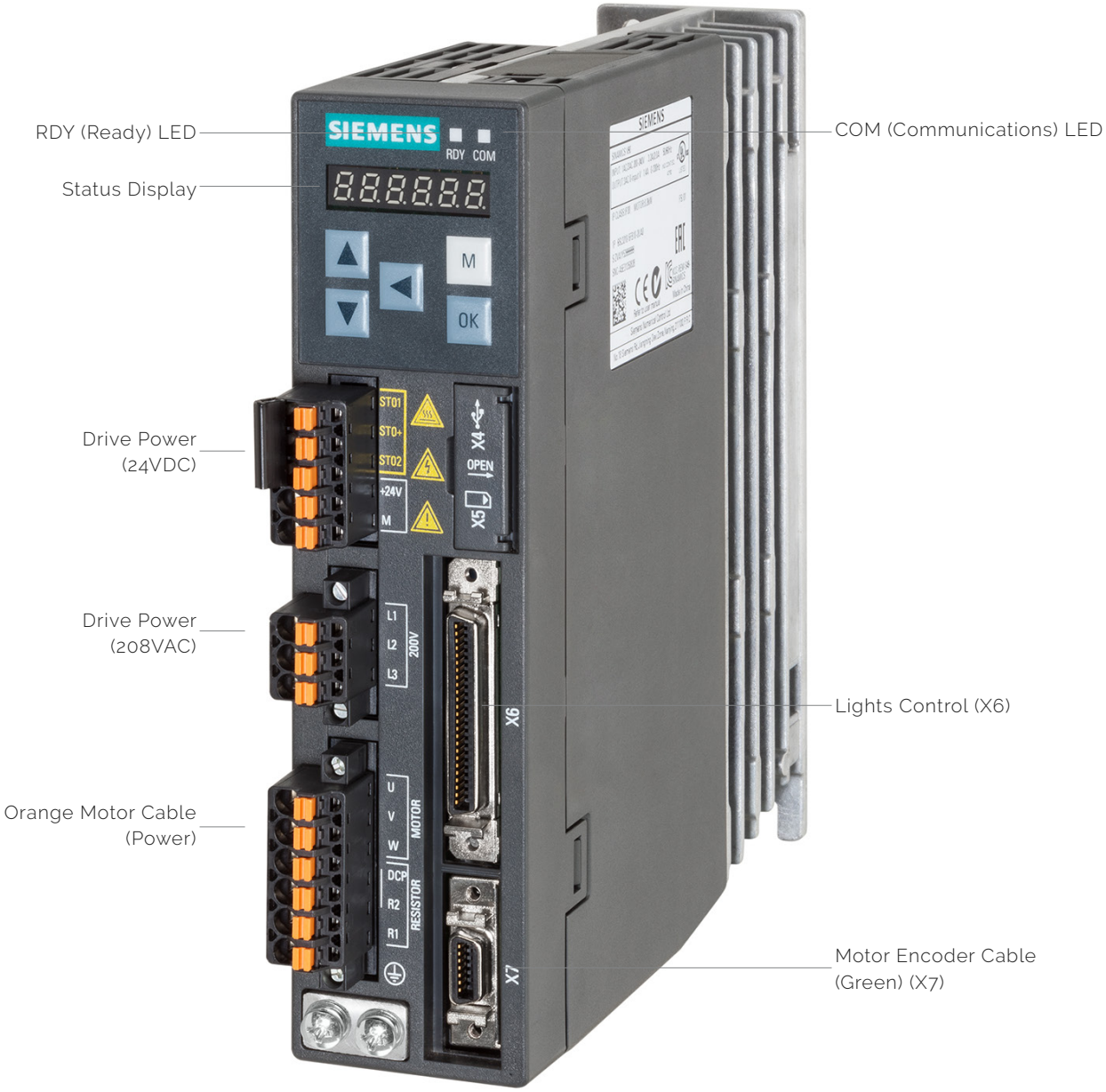
2.0 NANOTECH FURY TARGET UNITS

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
2.1 Misaligned target(s)	(1) Alignment error	(1) Navigate to the Menu Screen on the HMI Touch Screen. (2) Select Target Calibration.
	(2) Proximity sensor / turning motor fault.	(1) Contact Spire for technical support.
2.2 Nonresponsive targets (not moving)	(1) Turning motor position error	(1) Navigate to the Menu on the HMI touch screen. (2) Select Target Recalibration. (3) Reselect targets. (4) If the problem persists, flip the power switch of the HMI on the back of the enclosure. (5) Once the system has rebooted, tap the control touch screen to begin.
	(2) Obstruction in drive system	(1) Power off the targets. (2) Turn the target manually by hand to see if it turns. (3) If it doesn't turn, check the backside of the downrigger for obstruction. (4) Remove obstruction if one is present.
	(3) Turning motor fault	(1) Contact Spire for technical support.

2.1 SIEMENS FURY TARGET UNITS

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
2.11 Misaligned target(s)	(1) Alignment error	(1) Navigate to the Menu Screen on the HMI Touch Screen. (2) Select Range Settings. (3) Enter the lane number of the target needing homing in the Target to Calibrate field. Be careful to not change the # of Targets field. (4) Press the +/- buttons until the clamp is homed correctly. (5) Press Set Reference until the Actual Angle Degree shows either 0 or 360.
	(2) Turning motor fault.	(1) Contact Spire for technical support.
2.12 Nonresponsive target(s) (not moving) in middle of range	(1) Obstruction in drive system	(1) See 5.6.
	(2) Turning motor fault	(1) Navigate to the Menu Screen on the HMI Touch Screen. (2) Select Range Settings. (3) Press the Reset button in the lower-left corner. (4) If problem persists, see 5.6. (5) If problem persists, contact Spire for technical support.
2.13 Nonresponsive target(s) (not moving) from the left or right end of the range through X lane	(1) Damaged ethernet cable/port	(1) See 5.1.
2.14 Nonresponsive target(s) (not moving) from X lane through the last lane	(1) # of Targets set incorrectly	(1) Navigate to the Menu Screen on the HMI Touch Screen. (2) Select Range Settings. (3) Set # of Targets field to be some number higher than the # of lanes in the range. I.e. an example range has 32 lanes so you would enter 35 in the field. (4) Set # of Targets field to the number of lanes actually present in your range. I.e. in the previous example this would be 32. (5) Press the Reset button in the lower-left corner.
	(1) Damaged ethernet cable/port	(1) See 5.1.

SIEMENS MOTOR DRIVE LED STATUS (STANDARD)



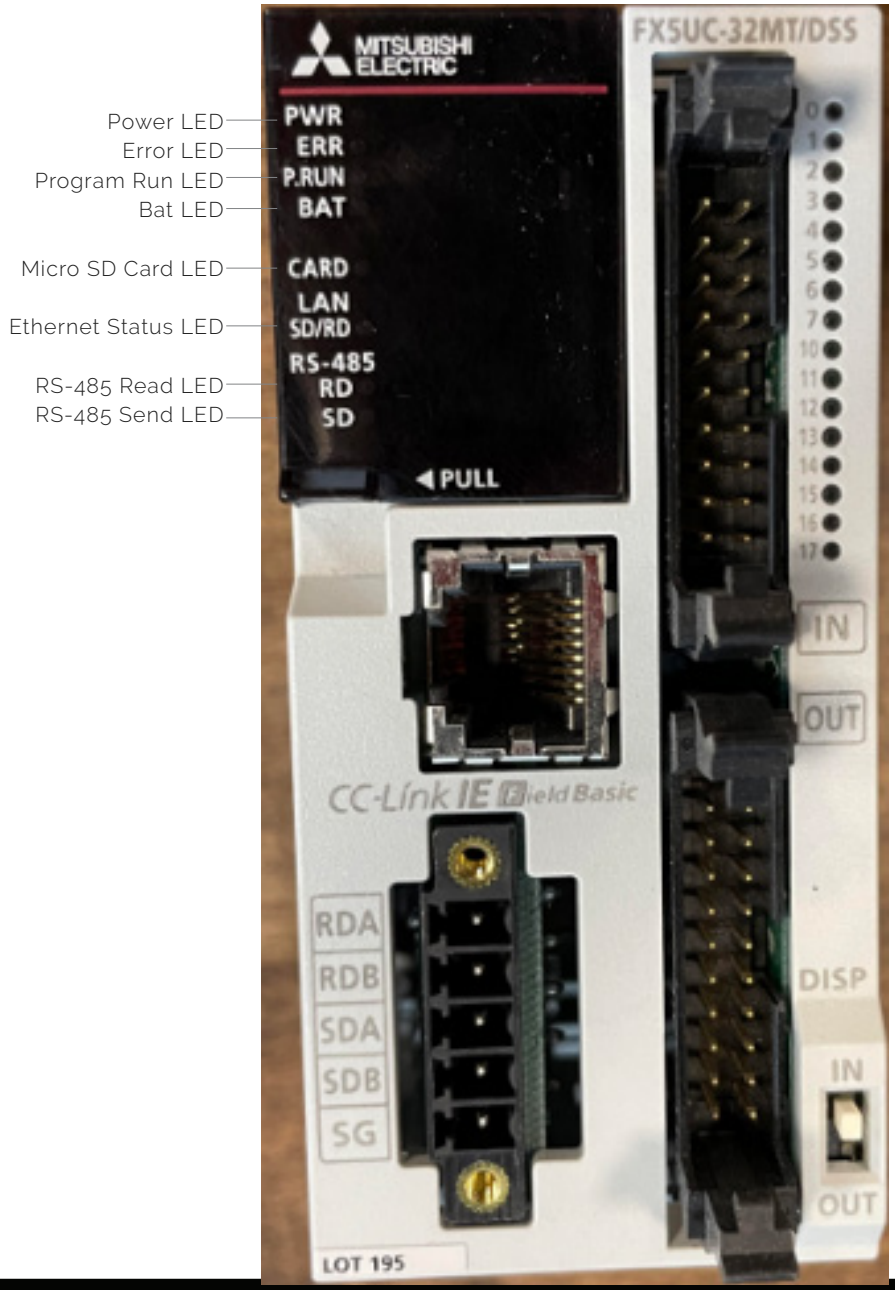
SIEMENS MOTOR DRIVE LED STATUS (FOAM BACKER)

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
5.0 No RDY or COM Light	(1) Bad power cable connection/damaged cable	(1) Inspect the drive power cables for damage. (2) Ensure that no breakers are flipped.
	(2) Bad drive	(1) Contact Spire for a replacement.
5.1 Red COM Light	(1) Communications with the PLC were lost	(1) Check the ethernet cable between the drive units with the orange COM lights and the drive units with green COM lights. Replace if needed. (2) Power cycle the range if the problem continues.
5.2 Flashing Red RDY Light	(1) Alarm/Fault Occurred	(1) See 5.3 and onward.
5.3 Fault F1911 (PROFIdrive: Clock cycle synchronous operation clock cycle failure)	(1) Communications with the PLC were lost	(1) See 5.1.
5.4 Fault F1912 (PROFIdrive: Clock cycle synchronous operation sign-of-life failure)	(1) Communications with the PLC were lost	(1) See 5.1.
5.5 Fault F7011 (Motor overtemperature)	(1) Motor overheated	(1) Power down targets on touch screen. (2) Wait 15-30 min for motors to cool down.
5.6 Fault F7450 (Standstill monitoring has responded)	(1) Clamp hitting shaft guard when spinning 360	(1) Pull up on the target clamp to close the jaws on the target further. (2) If that does not solve the issue, file the shaft gaurd down slightly to remove the interference.
	(2) Obstruction in belt	(1) Turn the targets off using the button on the touch screen. (2) Open the side of the motor housing (hogan house). (3) Remove any obstructions between the belt and the gears.
	(3) Belt too tight	(1) Open the side of the motor housing (hogan house). (2) Slightly loosen the button heads holding the motor bracket to the side of the hogan house. DO NOT remove completely. (3) Loosen the belt tensioning bolt (near the stand) slightly. It may be easier to remove the hogan house from the stand. Watch the cables for snagging.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
5.7 Fault F7900 (Motor blocked/speed controller at its limit)	(1) Clamp hitting shaft guard when spinning 360	(1) See 5.3.
	(2) Obstruction in belt	(1) See 5.3.
	(3) Belt too tight	(1) See 5.3.
5.8 Fault F8501 (PROFIdrive: Setpoint timeout)	(1) Communications with the PLC were lost	(1) See 5.1.
5.9 Fault F30004 (Drive heat sink overtemperature)	(1) Drive overheated	(1) Power down targets on touch screen. (2) Wait 15-30 min for motors to cool down. (3) If problem persists, check that the drive fans are running and not blocked.
5.10 Fault F30011 (Line phase failure in main circuit)	(1) Power cable damaged/loose	(1) Power down main breaker. (2) Check all power wiring (208VAC when live).
	(2) Motor phase failed	(1) Power down main breaker. (2) Check good connection on the orange motor power cable. (3) If problem persists, replace orange motor power cable while powered off. (4) If problem persists, replace target motor while powered off.
5.11 Fault F30015 (Phase failure motor cable)	(1) Motor phase failed	(1) See 5.10.2.
5.12 Fault F30021 (Ground Fault)	(1) Ground fault detected	(1) See 5.10.
5.13 Fault F30036 (Internal overtemperature)	(1) Drive overheated	(1) See 5.9.
5.14 Fault F31111 (Encoder 1: Absolute encoder internal error)	(1) Motor overheated	(1) See 5.5.
	(2) Encoder not detected	(1) Power down main breaker. (2) Check good connection on the green motor cable. (3) If problem persists, replace green motor cable while powered off. (4) If problem persists, replace target motor while powered off.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
5.15 Fault F52983 (No encoder detected)	(1) Encoder not detected	(1) See 5.14.2.
5.16 Alarm A1009 (Control module overtemperature)	(1) Drive overheated	(1) See 5.9.
5.17 Alarm A5000 (Drive heat sink overtemperature)	(1) Drive overheated	(1) See 5.9.
5.18 Alarm A8526 (PROFIdrive: No cyclic connection)	(1) Communications with the PLC were lost	(1) See 5.1.

NANOTECH FURY/TREADWELL PLC LED STATUS



PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
6.0 No Green PWR (Power) Light	(1) Bad power cable connection/damaged cable	(1) Inspect the PLC power cable (red/black/green cable coming out of the bottom of the PLC) 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 Steady/Flashing Orange ERR (Error) Light	(1) Communications with targets were lost	(1) Generally this is simply an alarm that there was a problem. If the targets are functioning correctly, then ignore the ERR light. This light will turn on every time the power off button on the HMI is used. (2) Check the cable connections on the affected target turner motors.
6.2 No Green P.RUN (Program Run) Light	(1) Program not running (switch in center Stop position)	(1) Move the switch under the black cover to the Reset position and hold for 5 seconds. Then move it back to Run position. (2) Ensure the switch is not in the center Stop position.
6.3 Flashing Green P.RUN (Program Run)	(1) Program paused/stopped (switch in center Stop position)	(1) See 6.2.
6.4 No Green LAN SD/RD (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.

SIEMENS PLC LED STATUS

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
6.5 Blank Screen and no lights	(1) Bad power cable connection/damaged cable	(1) Inspect the PLC power cable (red/black/green cable coming out of the bottom of the PLC) 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.
6.6 Orange STOP banner at top of screen	(1) Program stopped	(1) Program has been stopped. Flip open the cover. (2) Press the green RUN button. (3) Wait up to 5 min for banner to change to green and say RUN. (4) Try operating the targets. (5) If targets do not operate, reset power on the 15" touch screen and wait for it to boot up. (6) Try to operate targets. (7) If targets do not operate, contact Spire for further troubleshooting.

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.

THE PINNACLE OF SHOOTING RANGES™