AUTOMATED FLAGGER ASSISTANCE DEVICE

MODEL WAFD
PRODUCT SPECIFICATIONS | JANUARY 2022
1. **SYSTEM**

1.1. Description

The Wanco® Automated Flagger Assistance Device (AFAD) is a portable flagging station that enables a human flagger to remain off the road and out of the path of moving traffic, while the AFAD provides motorists with clear guidance through a temporary traffic control (TTC) zone.

Principal components of the Wanco® AFAD are its mechanical gate arm, dual red and yellow signal lights, a regulatory “STOP HERE ON RED” sign, and a wireless controller. The gate arm blocks traffic when it is down, and allows traffic to pass when it is up. The signal lights change automatically in coordination with the gate arm position: a red light tells motorists to stop while the arm is down, and a yellow light flashes continually while the arm is up.

The AFAD operator is in full control of the gate arm, manually triggering changes in gate arm position, and can operate either one or two AFADs with one controller. The controller offers several configuration options to suit the work zone and the operator’s needs.

The Wanco AFAD is compact and portable, making it easy to tow and deploy. Two AFAD trailers can be towed together by a single vehicle.

Power is provided by batteries, which are charged by an automated solar charging system. The remote control is continually charged by the AFAD power system when stored inside the lockable battery box.

1.2. Model

WAFD Automated Flagger Assistance Device

1.3. Temperature limits

<table>
<thead>
<tr>
<th></th>
<th>Operating</th>
<th>–4 to 158°F (–20 to 70°C)</th>
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<tbody>
<tr>
<td></td>
<td>Storage</td>
<td>–22 to 176°F (–30 to 80°C)</td>
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1.4. Standards

Compliant in accordance with MUTCD, December 2009

2. **FEATURES**

2.1. Setup

- Compact system is easy to transport and deploy
- Tow one trailer or two trailers
- Leveling jacks raise trailer tires off the ground to provide stability
- Heavy-duty hand-winch allows one person to easily raise and lower the sign and lights
- Single auto-locking device holds the tower in place while operating and during transport
- Gate arm remains attached during transport and for storage
- Gate arm extension can be removed and stowed
- Easy pairing and unpairing with wireless controller

2.2. Operation

- Remote control allows human flagger to remain off the road
- Wireless controller and cable-connected controller both included
- Flexible operation for one or two operators and AFADs
- Large signal lights are highly visible
- Operator can enable haul-road crossing mode
- Intrusion alarm activated from wireless controller
2.3. Wireless controller
- Full-color touchscreen with high-resolution display
- Intuitive easy-to-use interface
- Large AFAD buttons continuously indicate gate position and signal light behavior
- Prohibited operations are “grayed out” and inactive
- When two AFADs are controlled by one operator, the main control screen prevents both AFAD gates from opening at the same time
- Continuous display of wireless signal strength and power indicators
- Large “All Stop” button closes any open gate
- Individual vehicle-intrusion alarm buttons for each paired AFAD

2.4. Cabled controller
- Single large button opens and closes gate
- When cable is connected to control box, prevents wireless control

2.5. Power system
- Battery powered and solar charging
- Energy-efficient operation results in long run times
- Solar panel charges batteries automatically without intervention
- Charging system shuts down when batteries are fully charged, preventing damage
- Power system allows battery charging with solar panel or commercial power
- Cooling fan protects battery charger from overheating
- Battery box includes cradle and charger for wireless controller
- Battery box can be locked to prevent unauthorized access

2.6. Maintenance
- Standard trailer tires
- Bolt-on fenders can be replaced if damaged
- Durable powder-coat finish resists the elements

2.7. Application
Common applications include:
- Temporary traffic control zones
- Pavement patching operations
- Bridge maintenance
- Roadwork zones
- Partial road closures
- Haul road crossings

3. Gate
3.1. Gate arm
3.1.1. Description
Two-section tilting gate arm blocks passage of traffic in a single adjacent travel lane when tilted down in horizontal position

3.1.2. Tilt
Gate arm attached to tilt bracket that moves the arm up and down between horizontal (blocking traffic lane) and vertical (allowing traffic flow)

Tilt bracket movement controlled by electric actuator attached to tilt bracket at the top and the trailer frame at the bottom
3.1.3. Construction
Primary section attached to tilt bracket with one bolt; second section doubles gate arm length by attaching with a bracket and bolt to the free end of the primary section

3.1.4. Size
Rectangular tubing, 3" x 2½" (7.8 x 5.4cm) H x D
See “Options and Optional Equipment” for alternate size tubing

3.1.5. Material
Polyvinyl chloride (PVC), non-metallic

3.1.6. Conspicuity
Highly reflective microprismatic conspicuity tape on both vertical sides of gate arm, with alternating vertical red and white stripes at 16-inch (40.6cm) intervals (3M™ GA1616); tape runs along entire length of gate arm
3" (7.62cm) height
See “Options and Optional Equipment” for alternate conspicuity tape

3.2. Actuator
12Vdc electric actuator, 6" (15.24cm) stroke at 250 lb max. load

4. REGULATORY SIGN

4.1. Description
Standard R10-6 “STOP HERE ON RED” sign

4.2. Location
Mounted to tower, rises up for improved visibility when deployed and lowers for transport and storage

4.3. Size
24" x 36" (61 x 91cm) W x H

4.4. Material
Aluminum sheet, 0.080" (2mm) thick
White reflective coating (3M 3930-series high-intensity prismatic sheet, ASTM Type IV)

5. SIGNAL LIGHTS

5.1. Dual signal beacons

5.1.1. Description
Two LED beacon assemblies attached one above the other with colored lights

5.1.2. Beacon colors
Red light on top beacon (Leotek® T12R-LX6-1A281)
Yellow light on bottom beacon (Leotek T12Y-LX6-1A281)

5.1.3. Location
Mounted to tower that rises up for improved visibility when deployed and lowers for transport and storage

5.1.4. Behavior
Gate open
Flashing yellow signal
Gate open, 5-second countdown before closing
Steady yellow signal
Gate closing
Steady red signal
Gate closed
Steady red signal
Gate opening
Steady red signal
5.1.5. Flash rate  50 times per minute  
50% duty cycle

5.1.6. Housing  12-inch yellow polycarbonate beacon head (Mobotrex® SA101A1C11YYY00)  
Hinged door provides access to interior, light, and wiring  
Tunnel type visor extends 9.75" (24.8mm) from door surface

6. SIREN

6.1. Description  Alerts road workers when traffic has improperly entered the traffic control zone; siren sounds when the operator activates the intrusion alarm using the wireless controller

6.2. Sound  1-tone siren, 110 dB

6.3. Power  15W, 12Vdc

6.4. Rating  Rated for outdoor use

7. CONTROL SYSTEM

7.1. Description  Self-contained onboard control system manages signal light and gate arm functions

7.2. Control box

7.2.1. Function  Weatherproof control box contains system electronics

7.2.2. Size  11" x 14.9" x 5.11" (28 x 38 x 13cm) W x H x D

7.2.3. Material  Acrylonitrile butadiene styrene (ABS), gray

7.2.4. Location  Securely fastened to tower

7.2.5. Door  Front-panel is a door, hinged on the left, which opens fully  
Two stainless steel latches hold door closed  
Door can be locked with user-supplied padlock for added security

7.2.6. Pair button  Initiates pair mode to support linking wireless controller with onboard control system  
Momentary switch located behind rubber boot on bottom of control box

7.3. Wiring  All control system wiring routed inside liquid-tight loom, and attached with P-clamps riveted to trailer frame; no exposed wiring. Wiring service loop is designed to allow tower with signal lights to be raised and lowered.
7.4. Wireless controller

7.4.1. Description Wireless touchscreen controller provides access to all control functions for one or two synched AFADs

7.4.2. Touchscreen

**Display**

- Full color, backlit, 4.3-inch display
- Resistive touch panel
- 480 x 272 pixels, W x H
- Display remains on continuously while in use and automatically shuts off after 15 minutes of inactivity to conserve power

**Interface**

- Main screen provides gate arm control for paired AFADs, intrusion alarm control, battery charge and signal strength indicators, and access to settings and system information screens
- Settings screen provides access to pairing and other functions
- System information screen provides:
  - Software and hardware versions
  - Battery voltages for controller and paired AFADs
  - Wireless signal strength for controller and paired AFADs
  - Alert indicators for voltages and signal strength
  - FCC regulatory declaration

See Exhibit A for sample screens and additional information

7.4.3. Housing

- Molded impact-resistant EPDM rubber, dark gray
- Flexible material tightly wraps around and holds together the controller and battery pack
- Ported for insertion of charging connector
- Includes integral sunshade and holes for connecting neck strap

7.4.4. Neck strap

- Adjustable neck strap can be detached and replaced when needed
- Two double-hook “S” shape carabiners connect strap to controller housing

7.4.5. Storage

- Cradle located inside battery box, holds controller assembly for storage, charging, and transport

7.4.6. Power

- 8-cell, Li-Ion battery pack, lasts 60 hours on a single charge
- Typical charging time: 4 hours from fully depleted to fully charged using system charger
- 7.2V, 14Ah capacity

7.4.7. Charging

- 12Vdc to 120Vac power inverter, 120Vac to 8.4Vdc system charger with power cord
- Power cord plugs into charging port on bottom of controller
- Located inside battery box
- Charger can be removed from battery box and plugged into standard 110Vac power outlet
7.4.8. Radio transceivers  
XBee-PRO® S38 Point2Multipoint, 915MHz, 10Kbps  
1000 ft (305m) range from controller to AFAD trailer

7.4.9. Antenna  
Controller  
1/4-wave wire whip integrated antenna  
AFAD  
Yagi RF antenna, 4-element, 896–980 MHz, 8 dBi

7.5. Cabled controller

7.5.1. Description  
Cable-connected push-button controller provides control of gate arm on connected AFAD  
While connected, prevents wireless connection

7.5.2. Function  
Single push-button controls gate arm up/down motion

7.5.3. Cable  
Hard-wired to controller; loose end fitted with connector and retaining ring for attaching  
to port on bottom of control box  
Length: 15 ft (4.6m)

8. **TRAILER**

8.1. Frame  
All welded structural steel

8.2. Tie-downs  
Two tie-downs: one centered on front of frame, one centered on rear of frame

8.3. Finish  
Oven-baked, safety-orange powder-coat finish to ensure durability and corrosion  
protection. Assemblies are bead-blasted and then run through a five-stage, high-pressure  
phosphate-wash prior to application of the finish coat.  
See “Options and Optional Equipment” for color options.

8.4. Fenders  
Round, full wheel coverage, bolted to trailer frame, removable and replaceable

8.5. Axle assembly  
1200 lb (544kg) capacity, 5 on 4.5” B.C. idler hub

8.6. Springs  
Double-eye leaf springs

8.7. Tires  
ST175/80D13 steel-belted trailer tires, load rating C

8.8. Drawbar

8.8.1. Construction  
Telescopes inside receiver sleeve welded under trailer frame. Removable for shipping and  
for added theft protection if needed. Secures with two 1/2-inch (12mm) diameter bolts.

8.8.2. Material  
Square tubing, 3” x 3/16” wall (7.62cm x 0.476cm wall)

8.8.3. Jack  
Top-wind swivel, 2000 lb (907kg) capacity, steel footpad, 10” (25cm) total travel

8.8.4. Tow hitch  
Standard 2-inch ball coupler tow-hitch, SAE Class 2, 3500 lb (1588kg) capacity. Bolts to  
drawbar, removable and replaceable.  
See “Options and Optional Equipment” for tow-hitch options.
8.8.5. Tow chains

Two high-test proof coil chain assemblies with clevis slip hooks attaching to tow vehicle. Chains attached to drawbar with quick connectors. Removable and replaceable.

Material diameter 0.406" (10.3mm)
Working load limit 5400 lb (2450kg)
Breaking force 16,200 lb (72kN)

8.8.6. Tandem tow hitch

Rear-mounted 2-inch ball hitch for tandem towing two AFAD trailers with one tow vehicle

See “Options and Optional Equipment” for tandem- and dual-tow options

8.9. Stabilizer jacks

Four swivel jacks, each with 2000 lb (907kg) capacity, mounted on corners of trailer frame

8.10. Wiring

8.10.1. Description

Wiring to connect tow vehicle and trailer for trailer taillights is installed inside drawbar, with pigtails and connectors at both ends; no crimping required

8.10.2. Trailer plug

A sealed, molded, 4-square connector plugs into harness under trailer

8.10.3. Tow-vehicle plug

Two-piece assembly with 4-flat molded connector on harness plugs into tow vehicle

Meets SAE J1239

See “Options and Optional Equipment” for tow-vehicle plug options

8.10.4. Protection

All trailer wiring encased in UV protective loom, and attached with P-clamp riveted to trailer frame; no exposed wires

8.11. Taillights

Two oval-shaped, sealed, LED, combination stop, turn and taillights mounted to top of trailer deck behind fenders; each light held in place and sealed with snap-in rubber grommet

8.12. License plate

Lighted license plate light holder is mounted under rear of trailer frame

8.13. Reflectors

Sides of trailer have amber reflectors near front

See “Options and Optional Equipment” for reflective tape

8.14. Tower assembly

8.14.1. Function

Signal lights and regulatory sign are raised and lowered on a tower

8.14.2. Tower construction

Two sections of square steel tubing with the inner section telescoping inside the outer section.

Nylon guide blocks keep the sections tight, eliminating the need for greasing the tower and preventing dirt from building up on the inner tower section. Dirt would cause performance problems and maintenance issues.
8.14.3. Finish

Lower tower section and base are coated with oven-baked, safety-orange powder-coat finish to ensure durability and corrosion protection. Assemblies are run through a five-stage, high-pressure phosphate-wash prior to application of the finish coat.

Upper tower section is treated for corrosion resistance.

See “Options and Optional Equipment” for color options.

8.14.4. Winch assembly

- **Function**: Hand-operated winch raises and lowers sign cabinet
- **Capacity**: 200 lb (91kg)
- **Brake**: Safety friction-brake prevents display cabinet from falling if operator loses grip on winch handle
- **Cable**: 3/16” (4.76mm) diameter galvanized aircraft cable

8.14.5. Height lock

Spring-loaded locking pin prevents tower from falling if the winch or cable were to fail

9. **POWER SYSTEM**

9.1. Description

Electronics powered by batteries, which are charged automatically with integrated solar charging system

9.2. Battery box

9.2.1. Function

Holds batteries and remote charger

See “Options and Optional Equipment” for heavy-duty secure battery box

9.2.2. Construction

Riveted all-steel construction

All parts powder-coated before assembly

Divider panel inside box separates batteries from electronics

Louvers provide ventilation

Latches keep cover closed and can accept user-supplied padlocks

9.2.3. Location

Centered between fenders, bolted to trailer frame

9.3. Batteries

9.3.1. Description

Four deep-cycle golf-cart-type batteries, wired in parallel and series for a 12-volt system

See “Options and Optional Equipment” for battery options

9.3.2. Voltage

6Vdc each

9.3.3. Weight

Approx. 60 lb (26kg) each

9.3.4. Capacity

416Ah total capacity @ 12Vdc

9.3.5. Low-voltage disconnect (LVD)

To protect batteries from full discharge, the LVD system automatically shuts down power when battery voltage drops to preset level, and re-engages power when battery charge returns to optimum
9.4. Remote charger

9.5. Function
   Plugs into a standard commercial power source to recharge batteries if battery voltage drops due to lack of sun for automated solar charging system

9.5.1. Type
   12-volt battery charger

9.5.2. Location
   Inside battery box, mounted to divider panel on opposite side from batteries

9.5.3. Output capacity
   15A

9.5.4. Output voltage
   13.2Vdc range “float” mode
   13.6Vdc range “absorption” mode
   14.2Vdc range “bulk” mode

9.5.5. Input voltage
   105 to 135Vac, standard three-prong plug

9.5.6. Input frequency
   50 to 60 Hz

9.5.7. Cooling
   Automatic fan cooling

9.6. Solar

9.6.1. Panels
   One high-efficiency photovoltaic solar module

9.6.2. Location
   Top of tower. Solar panel array lies flat and rises with tower. No shadowing effect from any trailer component.

9.6.3. Power output
   85W
   See “Options and Optional Equipment” for solar power options

9.6.4. Current
   4.91A max. system current
   5.47A open short-circuit current

9.6.5. Voltage regulation
   17.3Vdc max.
   21.6Vdc open short-circuit voltage

9.6.6. Regulation
   Solar power input regulated by control system
10. **DIMENSIONS & WEIGHT**

10.1. Dimensions

10.1.1. AFAD

*Travel position*

*Deployed*
10.1.2. Wireless controller

10.2. Weight

10.2.1. AFAD Approx. 875 lb (397kg)

10.2.2. Wireless controller Approx. 2 lb (1kg)
11. **OPTIONS AND OPTIONAL EQUIPMENT**

11.1. **Lights**

11.1.1. **Signals backplate**
Black backplate provides a dark silhouette around signal lights, shielding them from background light and obstructions.

11.1.2. **Indicator light**
Rear-facing light installed behind signal lights, for when the operator’s location prevents direct viewing of the signal lights.

11.2. **Gate arm**

11.2.1. **Arm**
Replace standard gate arm with alternate arm.
Options
- 3" (7.62cm) arm height with right-slant diagonal stripes
- 4.5" (11.43cm) arm height with vertical stripes

11.2.2. **Short extension**
Additional extension lengthens arm by 2 feet (61cm).

11.2.3. **Flag**
Flag attaches to end of gate arm and hangs from arm; easily removable.
- 24" (61cm) square, fluorescent orange vinyl

11.2.4. **Breakaway arm**
Allows gate to swing out of the way when struck by a passing vehicle, reducing chance of damage. Spring-tensioned mechanism returns arm to default position.

11.3. **Towing**

11.3.1. **Drawbar tow hitch**
Combo-hitch for pintle hook and 2-inch ball hitch.
Heavy-duty lunette ring, 2½" ID x 1⅝" cross-section

11.3.2. **Tandem tow hitch**
Pintle hook for 2½" to 3" lunette ring, replaces standard tandem-tow hitch.

11.3.3. **Nested dual-tow**
Dual-tow yoke for towing two nested AFAD trailers as though they were a single unit, without the articulation of drawbar tandem towing.

11.3.4. **Tow-vehicle plug**
Many types of plugs available, prewired at the factory; contact factory for details.

11.4. **Power**

11.4.1. **Additional batteries**
For geographic locations with less solar charging potential or colder weather, and for applications that require year-round charging, add batteries for greater capacity.
Option
- Two additional 6Vdc deep-cycle batteries, 208Ah additional capacity

11.4.2. **AGM batteries**
Replace deep-cycle batteries with top-of-the-line absorbed glass mat (AGM) batteries.
Features
- 100% maintenance-free
- Sealed and spill-proof
- Faster recharge and greater freeze resistance than conventional batteries
- Contains less lead than conventional batteries
Options
- Two 4D AGM 12Vdc batteries, 400Ah total capacity
- Three 4D AGM 12Vdc batteries, 600Ah total capacity

Weight
- Approx. 160 lb (72kg) each

11.4.3. Remote charger
When required for added battery charging capacity, replace standard remote charger with higher amperage charger

Option
- 12-volt, 45-amp charger

Details
- Output voltage
  - 13.4Vdc @ full load
  - 13.6Vdc standard float voltage
  - 14.2Vdc with dual-voltage jack installed
- Input voltage
  - 108 to 132Vac, standard three-prong plug
- Input frequency
  - 50 to 60 Hz

11.4.4. Solar
For geographic locations with less solar charging potential or colder weather, and for applications that require year-round charging, additional solar power is available

Option
- 100W solar panel replaces standard solar panel

Current
- 5.81A max. system current
- 6.39A open short-circuit current

Voltage
- 17.2Vdc max.
- 21.6Vdc open short-circuit voltage

11.5. Trailer

11.5.1. Secure battery box
High-security battery box features heavy-gauge steel lid, hidden hinges, and heavy-duty hidden-shackle padlocks. Replaces standard battery box.

11.5.2. Reflective tape
Reflective red-and-white conspicuity tape across rear trailer frame for increased visibility

11.5.3. Finish color
Specify power-coat color and, if applicable, color scheme
EXHIBIT A: WIRELESS CONTROLLER SCREENS

Two AFADs

System status and settings

Left AFAD control

Right AFAD control

Left AFAD horn

Right AFAD horn

Single-press all stop causes both signals to turn red and both gates to close

One AFAD

System status and settings

AFAD control

AFAD horn

Single-press all stop causes signal to turn red and gate to close

Gate-up AFAD

AFAD wireless signal strength

AFAD number

Current gate position (up)

>> CLOSE

Gate-down AFAD

AFAD wireless signal strength

AFAD number

Current gate position (down)

Red signal on

Gate action when button is pressed

Gate action not available when other AFAD gate is up (button is “grayed out”)

Button becomes active when other AFAD gate is down

Gate action when button is pressed