# SECTION 11 86 85 – RAMP INFORMATION DISPLAY SYSTEMS

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

A. Large Format Display Systems and Messaging Boards intended for use as Ramp Information Display Systems (RIDS) for aircraft pilots and ground crews.

B. Control Software for LED display systems

### 1.2 REFERENCES

A. National Electrical Manufacturers Association (NEMA).

B. ANSI/InfoComm 10:2013 – Audiovisual Systems Performance Verification.

C. ANSI/UL 879 – Electric Sign Components.

D. CAN/CSA-C22.2 No. 27 – Portable and Stationary Electric Signs and Displays.

E. Standard for Electric Signs, UL and CUL Listed

F. Standard for Control Centers for Changing Message Type Signs

G. Federal Communications Commission Regulation Part 15

H. National Electric Code

I. Designed to current UBC or IBC standards

J. FCC Class A Compliant

K. DFW Design Criteria Manual

### 1.3 DESIGN / PERFORMANCE REQUIREMENTS

A. Large format display systems and messaging boards shall be certified for use in United States and Canada and shall bear the ETL Verified Mark. System complies with ANSI/UL 879 and CAN/CSA-C22.2 No. 27.

### 1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00 – Administrative Requirements.

B. Product Data: Provide manufacturer’s data sheets on each product to be used, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.
3. Installation methods.
4. Operation and maintenance instructions.

C. Shop Drawings: Provide shop drawings indicating details of construction, fabrication, and installation of signage systems including but not limited to wiring diagrams, cable routing, interconnections between equipment, anchorage details, and relationship with supporting structure and adjacent construction.

D. Custom Mounting: Coordinate with support structure specified in Section 05 50 00 – Metal Fabrications and as indicated on the Drawings for custom mounting and support of the large format display and messaging board system(s) specified.

E. LEED Submittals: Provide documentation of how the requirements of Credit will be met:

1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
2. Product data and certification letter indicating percentages by weight of post- consumer and pre-consumer recycled content for products having recycled content.
3. List of systems and sub-systems that allow for dynamic scheduling of on-time (energy consumption) based on ambient light and room occupancy.

F. Warranty Documentation. Provide warranty documentation, with start date(s) and service contact(s).

G. Record Documentation: Provide as-built schematics of the system design showing the quantity, type and location of components, cabling and accessories.

H. System Reports:

1. Report an inventory of electronic system components, including model number, serial number, and firmware version.
2. Report the verified quantity of panels installed per local control zone.
3. Report all system settings.
4. Report testing and commissioning data.

I. System Settings Backup: Provide an electronic file of all system settings.

J. Security Items:

1. Provide one set of keys for each locked equipment enclosure, if present.
2. Provide passwords to access control functions for hardware and software user interfaces, if present.

## 1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum five years documented experience in work of this Section.

B. Authorized Manufacturer Representative: System shall be configured and commissioned by an authorized manufacturer representative.

C. Installer Qualifications: Minimum two years documented experience in work of this Section.

D. Review installation procedures and coordination required with related Work.

E. Inspect and make notes of job conditions prior to installation:

1. Record minutes of the conference and provide copies to all parties present.
2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
3. Installation shall not begin until all outstanding issues are resolved to the satisfaction of the system designer, GC and/or end user.

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle products in strict compliance with manufacturer's instructions and recommendations and industry standards.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Store materials within absolute limits for temperature and humidity recommended by manufacturer. Protect from damage.

## 1.7 SEQUENCING

A. Ensure that information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.

## 1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Products shall not be installed until painting and other finish work is complete.

## 1.9 WARRANTY

A. Manufacturer's warranty shall includes all components against defects, materials and workmanship when installed and operated in accordance with the product specifications and manuals.

B. Warranty Period: Provide minimum of 5 Year warranty, with available warranty extension up to 10 Years.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. ADB Safegate.
2. Substitutions: As approved by Engineer.

B. All substitutions must be submitted to the engineer, owner, or owner's representative for approval, prior to providing a formal submittal.

## 2.2 PANELIZED LED DISPLAY SYSTEM(S)

A. LED Display System(s) for outdoor application:

1. Description: NanoLumens displays are made up of modular panels (Nixels™), each populated with a matrix of RGB-SMD-LED packages, arranged in a continuous array on a modular metal frame. These Nixel™ modules are mounted magnetically to the frames to permit full access to all components within display from the viewable (front) side, or double-sided if required. Displays are fully front-installable and front-serviceable unless called for otherwise within the design. Each display is controlled by an off-board, rack mounted proprietary Display Interface Unit (DIU) or Units depending on total display resolution.

    a. Layout and Configuration: As indicated on Drawings.

## 2.3 DISPLAY performance

A. Display Capability

1. The LED display shall present messages that are continuous, uniform, and unbroken in appearance.
2. The LED display shall be capable of displaying all true type fonts.
3. The LED display shall be capable of dimming of all colors.
4. The display shall be able to display messages composed of any combination of alphanumeric text, punctuation symbols, and graphic images.

B. Controller

1. The display's controller shall be able to run independently from a controlling computing device allowing the display to operate even when the controlling device is unhooked or turned off.
2. Communication protocol shall support other matrix products from the vendor such as other outdoor or indoor displays of varying sizes and/or colors.
3. Each controller shall be connected to a light sensor allowing each LED display to automatically adjust brightness according to display direction and lighting conditions.
4. Active presentations, stored presentations, schedules, display configuration, time and date shall be stored in non-volatile memory. No external power or battery backup will be required to maintain this data.

C. Control and Communications

1. The display controller should be DHCP-enabled and allow for static IP addressing.
2. The LED controller shall be able to receive instructions from and provide information by using the one of the following communication modes:

    b. Fiber Optic Cable

    c. Ethernet CAT5/5e/6/6A Cable

D. Hardware Specifications:

1. Cabinet display configuration is single-face, one sided display
2. Cabinet weight per face shall not exceed 350 lbs.

3. Display shall operate from the following power sources: 120/240 VAC, 60 Hz single-phase, including neutral and earth ground.
4. Display shall operate in a minimum ambient temperature range of -40° to +120°F (-40 to +50°C) and to a 95% humidity.
5. Internal display component hardware (nuts, bolts, screws, standoffs, rivets, fasteners, etc.) shall be fabricated from stainless steel, aluminum, nylon, or other durable corrosion-resistant materials suitable for the signage application.
6. Display materials shall use non-corrosive materials or have a protective coating so they shall be anti-corrosive and not degrade or oxidize.
7. Use surface materials in the active LED area, such as metal, plastic, or other face materials, designed for low sunlight reflectivity. Electrical display components shall be 100% solid-state.
8. The presence of ambient radio signals and magnetic or electromagnetic interference, including those from power lines, transformers, and motors, shall not impair performance of the display system.
9. The display shall have adequate ventilation provided by the use of fans.
10. Steel mounting points that can be used for mounting purposes shall be provided with the display and have the ability to be adjusted for alternative mounting methods.
11. Shall include lifting supports that can be removed after installation.
12. To meet the display readability requirements, the front face must be constructed in such a manner that it provides high contrast, low sunlight reflection and durability in all weather and site conditions.

E. Serviceability

1. The display housing shall provide safe and convenient service access for all modular assemblies, components, wiring, and other materials located within the housing.
2. All internal components shall be removable and replaceable by a single technician with basic hand tools.
3. Service access shall be easily obtained by removal of one or more modules/panels in front of the associated internal component.
4. Each module should allow simple removal with a single latch system.
5. Displays shall be designed with service features that minimize potential bodily harm.

## 2.4 DISPLAY COMPONENTS

A. LED display modules shall be constructed for good readability, long life, and ease of service.

1. Each module within the product family shall be designed with the same physical footprint.
2. All modules and their components shall be fully encapsulated and sealed to meet IP-67 standards.

B. Pixels shall be constructed with discrete LEDs, and these discrete LEDs shall conform to the following specifications:

1. LED half-life shall be an estimated minimum of 100,000 hours.

C. Power Supply

1. All power supplies shall be regulated, auto-ranging AC to DC power, with protection for the LED pixel, LED display and driver circuitry in the event of power spikes or surges.
2. Each power supply and their connectors shall be fully sealed to protect from corrosive environmental factors meeting IP-67 standards.

D. Internal Wiring

1. Wiring for LED display modules and other internal components shall be installed in the housing in a neat and professional manner.
2. Wiring shall not impede the removal of display modules, power supplies or other display components.
3. Wires shall not make contact with or be bent around sharp metal edges.
4. All wiring shall conform to the National Electric Code.

E. The display shall be protected from electrical spikes and transients.

F. The manufacturer shall provide an earth-ground lug on the display.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Do not begin installation until substrates and support structure is in place and properly prepared.

B. Ensure required power and data sources have been provided at Display installation locations.

C. Test all data cabling terminations using industry standard testing methods.

D. Ensure planned space is available for centrally located components.

E. Ensure third-party components interfacing with the system have been provided and tested using industry standard testing methods.

F. Notify Site Manager of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

A. Prepare substrates using the methods recommended by the manufacturer for achieving the best result under the project conditions.

B. Do not proceed with installation until support structure and substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

### 3.3 INSTALLATION

A. Install in accordance with manufacturer's written instructions and recommendations and in proper relationship with adjacent work.

B. Separate conduit must be used to route the power, signal in wires, and signal out wires.

C. Rigidly mount display(s) level and plumb with fasteners recommended by the manufacturer.

D. Displays must be grounded according to the provisions outlined in Article 250 of the National Electrical Code. The display must be connected to earth-ground.

E. Record any necessary changes to the system design.

F. Startup equipment in accordance with manufacturer's instructions.

## 3.4 CLEANING

A. Clean system components where required.

B. Clean systems per manufacturer' s suggestion.

## 3.5 CLOSEOUT ACTIVITIES

A. Demonstrate operational system to Owner/End User representative.

B. Instruct Owner/End User representative to maintain system and use any occupant controls or interfaces, as required.

C. Review service and support contact, ticketing and communication plan.

## 3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION 11 86 85**