SECTION 28 31 21.19

LiDAr Sensors area perimeter security systems

PART 1   GENERAL

1.1   SECTION INCLUDES

A.   Section includes a LIDAR detection mechanism incorporating continuous laser scanning in a 3D 360° field of view.

1.2   RELATED SECTIONS

A.   Section 28 31 21. 20   LiDAR perception software

[Specifier Notes]: Remove sections not required under project scope of work.

B.   Section 28 05 11   Cyber Security Requirements for Electronic Safety and Security

C.   Section 28 06 30   Schedules for Security Detection, Alarm, and Monitoring

D.   Section 28 16 13   Access Control Interfaces to Intrusion Detection

E.   Section 26 31 31   Intrusion Detection Interfaces

F.   Section 28 47 21.15   Notification Interfaces to Security Detection, Alarm, and Monitoring

G.   Section 28 51 51.15   Information Interfaces to Security Detection, Alarm, and Monitoring

1.3   REFERENCES

A.   Abbreviations
        1.   LIDAR: Light Detection and Ranging
        2.   3D: Three Dimensional
        3.   PoE+: Power over Ethernet Plus
        4.   FOV: Field of View
        5.   IEEE: The Institute of Electrical and Electronics Engineers
        6.   FDA: The United States Food and Drug Administration
        7.   FCC: Federal Communications Commission
        8.   ETSI: European Telecommunications Standards Institute
        9.   ROHS: Restriction of Hazardous Substances
        10.   IEC: International Electrotechnical Commission
        11.   WEEE: Waste from Electrical and Electronic Equipment
        12.   ASTM: American Society for Testing and Materials

B.   Reference Standards
        1.   IEEE 802.3 – Ethernet Standards
        2.   Laser Safety a. FDA Class 1 – Laser Safety
        3.   Enclosure Ingress Protection Rating IP67
        4.   IOS 9001

1.4   ADMINISTRATIVE REQUIREMENTS

A.   Coordination:

1. Coordinate with Owner or Owner's representative regarding LiDAR device network configuration and estimated bandwidth utilization prior to performing network connections.

B. Sequencing / Scheduling: Provide to Owner or Owner's representative a schedule and list of participants required to attend coordination and progress update meetings.

[Specifier Notes] – Retain only those individuals required to be in attendance for progress meetings. Delete the entire following sub-paragraph if not required.

1. Owner representative(s) for Facilities Management, Information Technology (IT) Services, and Security Management.
2. General Contractor.
3. Project Manager.
4. Manufacturer's Representative.
5. Project Architect.
6. Project Engineer.
7. Security Consultant.

1.5 INFORMATIONAL SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data: Manufacturer's product information and data sheets for each product specified in this section, including:
1. Substrate preparation instructions and recommendations
2. Installation means and methods.
3. Recommendations and requirements for proper storage and handling.

C. Shop Drawings:
1. Submit Manufacturer's approved shop drawings detailing the section and elevation views of each product to be installed.
2. Coordinate with locations listed on Contract Drawings.

D. Warranty Information:
1. Submit confirmation and details of manufacturer's warranty, extended warranty, and replacement policies.

E. System Support Resources:
1. Submit a list of available manufacturers providing fee based professional services available to the Contractor or Owner, including but not limited to the following:
   a. Training.
   b. Installation.
   c. Commissioning.
   d. Remote diagnostics and integration with 3rd party software and hardware systems.

1.6 CLOSEOUT SUBMITTALS

A. Supply licensing and registration information for all software, hardware, firmware, operational, and administrative licenses.

B. Supply network configuration backup files, restoration application and instructions.

1.7 MAINTENANCE SUBMITTALS

A.   Spare Parts: All Spare Parts must be delivered to the owner in their original sealed packaging. Clearly label with "SPARE: DO NOT REMOVE", and include manufacturer part numbers, and date of delivery to Owner. Store all spare parts in an environment and condition recommended by the manufacturer.

[Specifier Notes] – Retain one of the next two paragraphs based upon project requirements for spare components.

1.   One spare for each __10___ devices.
2.   Provide spare components as noted in the coordinating schedule for work listed in this section.

1.8   QUALITY ASSURANCE

A.   Qualifications – Installers:
1.   Installer must be licensed to install LiDAR equipment, video surveillance and security equipment as required by authority having jurisdiction.
2.   Installer must be capable of providing more than 2 references that will attest to successful completion of projects of similar scope as the work noted in this section.
3.   Installer must be certified by the manufacturer prior to the bid date and be up to date with all training required to maintain good standing.

1.9   WARRANTY

A.   Manufacturer Warranty: Provide manufacturer's warranty covering parts and labor costs to repair or replace part that fail to perform.
1.   Warranty Period: Parts and labor warranty for 24 months from date of Substantial Completion or date of purchase, whichever comes first.
2.   Service During Warranty: Provide direct support to Owner via phone and email, including access to training and education in the form of documents, videos and other materials via the internet.

END OF SECTION

PART 2   PRODUCTS

2.1   MANUFACTURERS

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Quanergy's products listed as the Basis of Design. Delete if not required.

A.   Basis of Design Manufacturer: Quanergy Solutions, Inc.
1.   Address: 128 Baytech Drive, San Jose, California, 95134, USA.
2.   Phone: (498) 245–9500.
3.   Website: www.quanergy.com.

[Specifier Notes] – Retain the following Paragraph if this document is written as a PERFORMANCE specification, without listing a manufacturer as a basis of design. Insert manufacturers that sell products comparable to those specified in this section. Delete if not required.

B.   Manufacturer List:

       1.   Manufacturer: Quanergy Solutions. Inc

Address: 128 Baytech Drive, San Jose, California, 95134, USA.

Phone: (498) 245-9500.

      Website: www.quanergy.com

2.2 GENERAL DESCRIPTION

A.   Each LiDAR shall support PoE+ and shall require nominal power of 18 watts

B.   Each LiDAR shall employ lasers at a wavelength of 905 nm, which shall be certified as Class 1 Eye Safe, according to IEC 60825-1.

C.   The LiDAR's shall be certified to have met the shock and vibration standard of ETSI EN 300 019-2-5, IEC Class 5M3.

D.   The LiDAR Sensor must have achieved the certifications and compliances of the FDA, FCC, CE, RoHS, WEEE, IEC-60079-15, and ASTM G154.

E.   Each LiDAR shall have a horizontal Field of View (FOV) of 360°, with 8 detection layers with asymmetrical spacing of the angles between each beam.

F.   Each LiDAR sensor shall generate a three-dimensional (3D) point cloud at 1.3 million points per second.

G.   Each LiDAR shall output no more than 25 Mbps in terms of bandwidth.

H.   Each LiDAR shall seamlessly integrate with Quanergy Q-Track perception software. See Section 28 31 21. 20

I.   The system shall have the ability to employ multiple LiDAR's. That number shall be determined by the size of the area of interest and the specification of the host computer(s) preferred by the user.

J.   Multiple LiDAR's should have the ability to be stitched together to create a complete live digital twin of an environment.

K.   Each LiDAR shall perform effectively for use indoors and outdoors in all lighting conditions of broad daylight, ambient light, and complete darkness, rain, snow, and other environmental disturbances.

L.   Each LiDAR shall withstand extreme weather from the bitter cold of –20°C/–4°F when operating, and –40°C/–40°F when in storage, to the baking sun and heat of 60°C/140°F when operating, and 105°C/220°F when in storage.

M.   Each LiDAR shall keep out weather particulates, operating with a IP67 rating of complete ingress protection from mist, rain, snow, and dust.

N.   Each LiDAR shall be connected to the software system via local LAN Ethernet over TCP/IP.

O.   Each LiDAR shall have an output connection of 100/1000 Mbps Ethernet.

P.   To collect the data for creating the point cloud, each LiDAR shall employ 8 detection layers, each of which measures distance to object by the Time of Flight (TOF) technique.

Q.   Each LiDAR shall have a variable update frequency (frame rate) of 5–20 Hz.

R.   At 10 Hz frequency, each LiDAR shall have an output rate of 420,000 points per second.

S.   Each LiDAR shall occupy dimensions of 103 millimeters in diameter by 87 millimeters in height, with a nominal weight of 900 grams.

2.3   ACCESSORIES

A.   Brackets and Mounts:
1.   M8–ADJ–MOUNT – Adjustable wall, pole or ceiling mount for use with the LiDAR sensor with pitch and roll adjustments.
2.   S3–2–CEING–MOUNT in-ceiling mount with faceplate and wall bracket.
3.   M8–MOUNT–PLATE adjustable "L" shape mounting plate.

B.   Other:
1.   POE–SHIELD – A wall and pole mount weather shield that provides protection from the sun and precipitation. For the M8–ADJ–MOUNT

END OF SECTION

PART 3   EXECUTION

3.1   EXAMINATION

A.   Verification of Conditions: Do not begin installation until substrates have been properly prepared.

B.   Evaluation and Assessment: If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2   PREPARATION

A.   Surface Preparation: Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3   INSTALLATION

A.   Install all products in this section following the product manufacturer's published installation and application manuals and guidelines.

3.4   CLOSEOUT

    A.   Demonstration:

        1.   Demonstrate administration and operation of devices described by this section.

        2.   Demonstrate how to authorize users and applications to operate and configure installed devices.

        3.   Demonstrate how an authorized user can gain access to and make changes to configuration.

        4.   Demonstrate how to operate functionality configured for this project as defined by configuration punch list.

END OF SECTION