




SPECIFICATION FOR ELECTRONIC ACCESS CONTROL SYSTEM (L-S29)


CKE.LS.06.29.(00).2018

JKR 20300-0121-23


**CAWANGAN KEJURUTERAAN
ELEKTRIK**

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1.0 General

1.1 Scope

- 1.1.1 This section of the specification describes and specifies requirements for the supply, delivery, installation, testing, commissioning, handing over in approved working order and maintenance during the Defects Liability Period of the whole Electronic Access Control System in accordance with the Specification, Schedule of Technical Data, Supplementary Notes, Bill of Quantities, Conditions of Contract, drawings etc.

1.2 Technical Particulars

- 1.2.1 Tenderers shall submit at the time of tendering all catalogues, detailed technical particulars and guarantees in respect of the equipment offered, which shall be binding. No departure from these technical particulars and guarantees shall be permitted except with the written approval of the Superintendent Officer (S.O) or S.O's Representative. Notwithstanding any description, drawings, illustrations or pamphlets which may be submitted with the tender, all details other than those stated by the tenderers in the schedule of departures from specification, at the time of tendering, shall be deemed to be in full conformity with the specification.

1.3 Guarantees


- 1.3.1 The tenderers shall guarantee all equipment to be supplied under this contract against faulty design, materials and workmanship at the manufacturer's works within the defect liability period (DLP).

1.4 Electrical System

- 1.4.1 All equipment shall be rated for operation on a 230/400 V (within the tolerance as defined in MS IEC 60038; 230/400 V, +10%, -6%), 3 phase, 4 wire, 50 Hz system with solidly earthed neutral.

1.5 Deviations to Specification


- 1.5.1 Any deviations, alternatives or substitutions of the materials as detailed in this specification shall be clearly stated in the tenderer's offer. In the absence of such indication, it shall be deemed that the tenderer is offering to supply goods fully in accordance with this specification.

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2.0 Description

2.1 System Description

- 2.1.1 The system shall consist of a combination of hardware and software to operate. The operating software which is the Windows based access management system shall have graphical user interface (GUI) for data entry and information retrieval, thus offering an easy management. The software shall be user friendly for the operator to control and operate the system easily. The software shall be installed in a computer or server.
- 2.1.2 The access controller shall be provided with a backup battery for it to operate in the event of mains failure for a minimum of three (3) hours. For safety purpose, there shall be an emergency break glass to open the door when there are problems with the electronic access control system.
- 2.1.3 The access system shall be linked to fire control system to allow automatic door release in the event of fire emergency.

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3.0 Equipment

3.1 Management Software

3.1.1 The management software shall be fully compatible with all the hardware installed. It shall have the following features:-

3.1.1.1 Supports door access, lift access, boom gate application, intrusion alarm monitoring, guard tour application and time attendance

3.1.1.2 Real time event monitoring

3.1.1.3 Unlimited access level configuration

3.1.1.4 User enrolment

3.1.1.5 Event based triggering

3.1.1.6 Interactive device control

3.1.1.7 Alarm monitoring

3.1.1.8 Server with support of at least three (3) client's concurrent access

3.1.1.9 Anti pass back

3.1.2 It shall support the total number of access controllers and access devices as shown in the drawing and bill of quantities.

3.1.3 Contractor shall train the user comprehensively for the followings:-


3.1.3.1 The creation of the users' data into the database and card activation. The training shall include registration of user credentials such as identification number, photograph, department etc. The process of printing the credentials onto card and enrolling it into the system shall also be trained and demonstrated

3.1.3.2 Managing the access control system such as enable/disable door, viewing event transactions, alarm control, status view etc.

3.2 Access Controller

3.2.1 The access controller shall be complete with power supply unit, backup battery, surge protective device etc. and housed in a suitable enclosure. In the event of lost communication with the host computer, the controller shall be able to operate independently using the on-board data. The controller shall comply to the following minimum technical specifications:-

Processor	:	32-bit microchip
Memory	:	In built for program, data and storage
Card Holder Capacity	:	10,000 users
Event Record Capacity	:	50,000 events
Inputs	:	five (5) (door sensor, exit request, fire alarm input etc.)

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Output	:	Relay
Network Port	:	RJ45
Door support	:	1 IN reader and 1 OUT reader, or otherwise specified in bill of quantities or drawing
Encryption	:	Encrypted communication to reader and upstream controller or computer

3.3 Reader


3.3.1 Card reader shall comply to the following minimum technical specifications:-

Type (Complying to)	:	ISO 14443A; ISO 14443B; Mifare Classic and Desfire EV1.
Card Technology	:	Desfire EV1 (card serial number (CSN) read, file read and write); Mifare Classic (CSN read, sector Read and write).
Encryption support	:	3KTDDES, TDES, AES128
Frequency	:	13.56 MHz
Interface	:	RS485 or Wiegand
LED Indicator	:	2 colours
Audio Beeper/Buzzer	:	Yes
LCD Display	:	128 x 64 pixels to display clock for time attendance application (where applicable)
Keypad	:	If specified in the bill of quantities or drawing
Weatherproof	:	Ingress protection, IP 55 for outdoor application

3.3.2 Biometric reader shall comply to the following minimum technical specifications:-

CPU	:	400 MHz DSP
Memory	:	4 MB flash memory and 8 MB RAM
Fingerprint Sensor	:	500 dots per inch (dpi) optical sensor
Identification Speed	:	2,000 match in 1 second
Fingerprint Capacity	:	10,000 templates (5,000 users)
Log Capacity	:	50,000 events
Interface	:	RS485 or Wiegand
Fingerprint Sensor	:	Optical Sensor
LCD Display	:	128 x 64 pixels to display clock for time attendance application (where applicable)

3.3.3 Ultra high frequency (UHF) reader shall comply to the following minimum technical specifications:-

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Frequency Range : 920 MHz to 923 MHz
 Read distance : Able to read up to 3 m
 Interface : RS485 or Wiegand
 Weatherproof : IP 55

3.4 Electromagnetic Lock

3.4.1 The electromagnetic lock c/w mounting bracket shall comply to the following minimum technical specifications:-

Holding Force : 600 lbs or 1200 lbs, as specified in bill of quantities or drawing
 Lock Type : Fail-safe type
 Voltage : 12 Vdc
 Maximum current draw : 500 mA

3.5 Magnetic Door Sensor

3.5.1 The magnetic door sensor shall comply with the following minimum technical specifications:-

Maximum Contact Rating : 100 Vdc, 500 mA, 10 W
 Wide Gap up to : 25 mm wide gap closed loop

3.6 Emergency Break Glass


3.6.1 The emergency break glass shall comply with the following minimum technical specifications:-

Current Rating : 3 A @ 36 Vdc
 Output Contact : Normally closed (NC);
 Normally open (NO);
 Common (COM)

3.7 Backup Battery

3.7.1 The backup battery shall comply to the following minimum technical specifications:-

Battery : 7 AH or otherwise specified in bill of quantities or drawing
 Nominal Voltage : 12 Vdc
 Type : Rechargeable Sealed Lead Acid

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3.7.2 The battery shall be fully charged to its operational capacity in not more than 24 hours after discharge. Low volt cut-off safety feature shall be incorporated to prevent over discharge of battery.

3.8 Key Switch

3.8.1 The key switch shall comply with the following minimum technical specifications:-

Contact Rating : 2 A 250 Vac

3.9 Boom (barrier) Gate Controller

3.9.1 The boom (barrier) gate controller shall consist of power supply unit, drive motor, speed reduction gear box, loop detectors and control panel. It shall comply to the following minimum technical specifications:-

Opening Speed : Less than 3 second
Internal Lubrication : Grease
Other features : Supports separate push button for opening, closing and stop;
Supports traffic light (red-green) output.

3.9.2 Equipment shall be housed in a suitable casing made from electroplated mild steel and finished with epoxy powder coating.

3.10 Heavy Duty Boom (barrier) Gate Arm


3.10.1 The boom (barrier) gate arm shall comply to the following minimum technical specifications:-

Material : Aluminium
Arm Length : 3 metre straight or otherwise specified in the bill of quantities or drawing
Arm Swing Out : Yes

3.11 Contactless Smart Card

3.11.1 The Contactless Smart Card shall comply with the following minimum technical specifications:-

Technology : Mifare Desfire EV1
Operating Frequency : 13.56 MHz
Data Storage : 4 kB
Desfire structure : 28 Applications with 32 files
Encryption support : 3KTDDES, TDES, AES128

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3.11.2 Card intended for long range read at boom (barrier) gate shall additionally be equipped with UHF capability operating at frequency range of 850 MHz to 950 MHz and detection range up to 3 metre.

3.12 Computer


3.12.1 The computer shall comply with the following minimum technical specifications:-

Operating System	:	Windows 10 or better
CPU	:	Intel Core i7
RAM	:	16 GB or greater
Free Disk Space	:	500 GB
Network Card	:	1000 Base-T
Display Resolution	:	1920 x 1080 pixels
Graphic Card	:	1
Graphic Adapter	:	512 MB and above
Optical Drive	:	DVD-R/W
Others	:	22" LCD Monitor, USB keyboard and USB mouse

3.13 Server

3.13.1 The server shall comply with the following minimum technical specifications:-

Processor	:	Intel Xeon processor E5-2600 v4 product family
Processor sockets	:	2
Number of core per processor	:	8
Core speed	:	2.2 GHz
Cache per processor	:	20 MB
Chipset	:	Intel C610 series chipset
Memory	:	24 DIMM slots; 8 X 4 GB DDR4 2133
I/O slots	:	Up to 3 x PCIe 3.0 slots plus dedicated raid controller slot
RAID controllers	:	Internal
Drive bays	:	Internal hard drive bay and hot-plug Backplane; 8 HDD bays;
Internal storage	:	1 TB 10,000 RPM hot-plug SAS 2.5" HDD
Embedded network interface card (NIC)	:	1 x 1 Gbps;
Operating systems	:	Latest Microsoft Windows Server – 64 bit

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3.14 Card Printer

3.14.1 The ID Card Printer shall comply with the following technical specifications:-

Print Method	:	Dye-sublimation/ resin thermal transfer
Resolution	:	300 dpi (11.8 dots/mm) continuous tone
Colours	:	Up to 16.7 million/ 256 shades per pixel
Print	:	Full-colour with resin black and overlay panel
Card Sizes	:	CR-80 (L x W) (85.6 mm x 53.98 mm)
Card Thickness	:	0.229 mm - 1.016 mm; 0.009" - 0.040"
Card Type	:	PVC or polyester cards with polished PVC finish
Memory	:	32 MB RAM

3.15 Desktop Card Reader

3.15.1 The Desktop Card Reader shall comply with the following minimum technical specifications:-

Protocols	:	Support Desfire EV1 Read and write into Mifare Desfire card, Programming master key, application key
USB Interface	:	USB 2.0 Full Speed Device (12 Mbps) USB 3.0 extended operability
Operating Systems	:	Windows 10 or better


3.16 Surge Protective Device For Power

3.16.1 The surge protective device for power shall comply with the latest JKR Specification for Low Voltage Internal Electrical Installation (L-S1), location category – socket outlet or terminal equipment.

3.17 Surge Protective Device For Data

3.17.1 The surge protective device for data shall comply and tested to MS IEC 61643-21 with the following technical specifications:-

Connection type	:	RJ45
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Maximum Continuous
 Operating Voltage, U_c : 57 Vdc
 Open Circuit Voltage, U_{oc}
 (1.2/50 μ s) : ≥ 300 V
 Voltage Protection Level, U_p : ≤ 120 V

3.18 Surge Protective Device For Signal

3.18.1 The surge protective device for signal shall comply and tested to MS IEC 61643-21 with the following technical specifications:-

Maximum Continuous
 Operating Voltage, U_c : 14 Vdc
 Open Circuit Voltage, U_{oc}
 (1.2/50 μ s) : ≥ 1 kV
 Voltage Protection Level, U_p : ≤ 20 V

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4.0 Wiring

4.1 General

- 4.1.1 General system of wiring, conduits, trunking, cable tray or cable ladder etc. shall be referred to the latest JKR Specification for Low Voltage Internal Electrical Installation (L-S1).

4.2 Service Colour Identification


- 4.2.1 All metallic conduits and trunking for the system shall be clearly identified and distinguished from other services.
- 4.2.2 Trunking for access system shall be identified using black "ACCESS/CCTV" letterings over white background. The letterings shall have a minimum height of 15 mm but need not exceed 50 mm, and at an interval not more than 1000 mm. All letterings shall be clearly legible, and to the satisfaction of the S.O or S.O's Representative.
- 4.2.3 Colour bands for conduits identification shall be as specified in the latest JKR Specification for Low Voltage Internal Electrical Installation (L-S1) or as approved by the S.O or S.O's Representative.

4.3 Installation

- 4.3.1 Mounting heights listed below shall be measured from the underside of the equipment to the finished floor level. Unless otherwise specified or directed on site by the S.O or S.O.'s Representative, heights of fixing shall be as in Table 4A below:-

Equipment	Typical mounting height (mm)
Door card reader	1000
Boom gate card reader	800
Boom gate UHF card reader	2000
Emergency break glass and key switch	1000

Table 4A: Typical mounting height

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5.0 Testing And Commissioning

5.1 Test Instruments

- 5.1.1 All measuring and test instruments used for testing and commissioning of the installations shall be regularly tested and calibrated by the manufacturers or accredited calibration laboratories for their functionality and accuracy. Test and Calibration Reports or Certificates for the measuring and test instruments issued by the calibration laboratory shall be valid for two (2) years from the date of issuance.
- 5.1.2 The instruments and their Test and Calibration Reports or Certificates shall be submitted to S.O or S.O's Representative for verification two (2) weeks before testing of the installations being carried out. No test on the installations shall be carried out without prior approval of the S.O or S.O's Representative. Notwithstanding the validity of the aforesaid Reports or Certificates the measuring and test instruments shall be re-calibrated if so required by the S.O or S.O's Representative after any mechanical or electrical mishandling. Fee required for the testing and calibrating of the measuring and test instruments is deemed to be included in the Contract.


5.2 Test and Test Certificates

- 5.2.1 After the installation work has been completed and before Certificate of Practical Completion is issued, the whole system shall be tested for compliance and performance as follows:-
- 5.2.1.1 Cables shall be tested for continuity;
 - 5.2.1.2 Functional test to indicate correct operation and performance of all equipment; and
 - 5.2.1.3 Any other tests which may be needed to demonstrate the satisfactory function of the system
- 5.2.2 The S.O or S.O's Representative reserves the right to be present at all tests and the Contractor shall give at least one (1) week notice in writing to the S.O or S.O's Representative for this purpose. In any case, no test shall be carried out without prior approval of the S.O or S.O's Representative. Copies of all the test certificates together with As-Installed Drawings properly bound and titled shall be submitted to the S.O or S.O's Representative within one (1) week after the completion of the testing.

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6.0 Service and Maintenance

- 6.0.1 During the Defects Liability Period, the Contractor shall be responsible for the service and maintenance work of the complete installation. All works shall be carried out by competent person. All labour, material, tools and parts necessary to rectify the defect due to manufacturing/installation faults shall be supplied/executed at the Contractor's cost.
- 6.0.2 The service and maintenance to be performed and defects to be rectified and making good shall include but not limited to the following:-
- 6.0.2.1 Repairs and replacement of all equipment and accessories that become faulty due to manufacturing and installation defects whether it is under the manufacturer's warranty or not;
 - 6.0.2.2 Replacement and making goods of all wiring and accessories;
 - 6.0.2.3 Making good any damage to roads, buildings, drains, cables, pipes, concrete areas, paved areas etc. which had not been properly made good arising out of his work; and
 - 6.0.2.4 All other works deemed as necessary by the S.O or S.O's Representative.
- 6.0.3 All works shall be carried out as soon as the Contractor is being informed by the S.O or S.O's Representative or the occupant, and shall be completed within a reasonable time except under emergency situation. If the Contractor fails to comply with the above requirements, the S.O or S.O's Representative reserves the right to engage another party to carry out the work, in which case, the Contractor shall be responsible for all the expenses incurred.

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7.0 Shop Drawings And As Built Documents

7.1 Shop Drawings

7.1.1 Two (2) sets of prints of shop drawings for construction and/or installation shall be submitted to the S.O or S.O's Representative for approval. The Contractor shall prepare and submit shop drawings for the whole work or parts of the work at least two (2) weeks before the work begins. If the shop drawings submitted are not acceptable by the S.O or S.O's Representative, the Contractor shall amend and re-submit the shop drawings within two weeks from the date of return of the shop drawings. No work shall be carried out without the shop drawings being approved by the S.O or S.O's Representative.

7.1.2 The shop drawings shall include and show the following:-

- 7.1.2.1 Co-ordinated dimensioned general arrangements, layouts and positions of accessories, equipment racks and all others necessary for the complete installation;
- 7.1.2.2 Schematic line diagrams of the installation;
- 7.1.2.3 The dimensioned general arrangements, layouts and routes of final circuits;
- 7.1.2.4 The dimensioned general arrangements, layouts, routes and positions of all lateral and vertical mains and/or sub-mains;
- 7.1.2.5 The dimensioned layouts and positions of all holes and cut-through in the walls and floors for the lateral and vertical mains and/or sub-mains; and
- 7.1.2.6 Co-ordinated routes for all cables laid external of the building;


7.1.3 The cost of all these shop drawings is deemed to be included in the Contract.

7.2 As Built Documents

7.2.1 As built document shall consist of but not limited to the as installed drawings, manuals, certificates, catalogues, inventories and parts lists.

7.2.2 The as installed drawings shall comprise of:-

- 7.2.2.1 Site plan;
- 7.2.2.2 External cable routes;

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7.2.2.3 Internal layout plans; and

7.2.2.4 Schematic diagrams.

7.2.3 These drawings shall be labelled at the lower right hand corner with the Electrical Contractor's name and address, date of commissioning, scale, drawing number (the drawing number to be obtained from the S.O or S.O's Representative), title and following particulars: -

JABATAN KERJA RAYA
CAWANGAN KEJURUTERAAN ELEKTRIK
CONTRACT NO.:

7.2.4 If the drawings submitted are not according to the actual installation at site and/or not acceptable to the S.O or S.O's Representative, the Contractor shall amend and re-submit the drawings within two (2) weeks from the date of return of the drawings to the satisfaction of the S.O or S.O's Representative.

7.2.5 Manual and documents for the installation shall be supplied. It shall comprise of:-

- 7.5.1.1 Installation manual;
- 7.5.1.2 Operation manual;
- 7.5.1.3 Service and maintenance manual;
- 7.5.1.4 Inventories and parts list;
- 7.5.1.5 Product data and catalogue;
- 7.5.1.6 Product test certificates; and
- 7.5.1.7 Installation test results.

7.2.6 Each of the as built documents shall be bound together with hard cover and submitted in minimum four (4) sets upon issuance of Certificate of Practical Completion of the project.

7.2.7 In addition, one (1) set of the as installed drawing shall be submitted in the form of tracing/original document, and two (2) sets in CD ROM.

7.2.8 The cost of all these prints, manuals, tools etc. whether or not provided in the Bill of Quantities, is deemed to be included in the Contract.