

SOUTH EAST CENTRAL RAILWAY

Annexures of tender

Annexure-A

Multi Section Digital Axle counter (MSDAC)

Design, Supply, Installation, testing and commissioning of MSDAC with all accessories consisting of complete indoor and outdoor equipment as per RDSO Specification no. RDSO/SPN/176/2013 Ver. 3 or latest amendment/ revision of required Track Sections.

1. Technical details:

- a. MSDAC will be used for proving track vacancies in (1) station yard in standby of track circuit from home signal to home signal of station.
- b. Configuration of MSDAC shall be submitted by the successful bidder before supply of materials.
- c. Main Track Section, Standby Track Section and Supervisory Track Section shall be derived independently and submitted for approval.
- d. MSDACs will be provided in standby mode with dual detection and supervisory track sections. The supervisory track section consists of two main track sections.
- e. The system A (Main) and system B (Standby) MSDAC of all lines will be completely segregated including the DP, evaluator, Power supply etc., in such a way that any single component (card, module, cables, detection point, fuse etc.) failure shall not affect the other line i.e. segregation of Evaluators for each line(Main System evaluator and Standby system Evaluator for each line).
- f. **Supply, Installation, Testing and Commissioning of Dual Multi Section Digital Axle Counters in block section with 100% redundancy. The main and standby digital axle counters of different make (OEM) shall be installed for provision of dual detection systems as per SECR Policy Circular No.- 02/2025, Dated: 21.06.2025.**
- g. **100% redundancy at Back pane level and Evaluator level shall be provided. Each line & each system of dual DAC shall have 100% level of redundancy which means line wise segregation of evaluators to be ensured as per RDSO TAN.**
- h. The system A & B for one side's section of any station will be completely segregated including the evaluator, Power supply, Rack & all other items with the system A&B for other side's section of the same station.
- i. It should have facility to reset track section both automatic (from standby & supervisory tracks) and manual resetting. Manual resetting of Axle counters in case of failure of Auto resetting/resetting through supervisory track section, will be done using soft reset from VDU of EI.
- j. The manual resetting system will be with cooperative type. Track section and Supervisory Track section reset command will be given from VDU of EI at Sending station and Co-operation will be given from Receiving station.
- k. Any failure of MSDAC system or track failure status must be logged in datalogger. All systems including media converter switches etc. to be monitored via datalogger. Any failure of redundant system/equipment etc. to be monitored via datalogger.
- l. The required length of inbuilt cable with Axle Detector is up to 15m or as required at site.
- m. For earthing of DP Dual rail earth or another scheme as recommended by OEM is to be followed.
- n. It should fulfill all the TAN/guidelines/instructions issued by RDSO/SECR HQ up to date.
- o. Track cleared and occupied indication and Reset indication of each Track section shall be provided at both sending and receiving station.
- p. The MSDAC system provided in the Auto-section will be interconnected with OFC/6Quad/E1 for modem. All the MSDAC related information should be transferred via MSDAC system only.

In case of failure of one media the MSDAC system shall automatically changeover the other media seamlessly.

- q. MSDAC shall have Evaluator to Evaluator communication. And Evaluator to Evaluator communication shall be through OFC only.

2. Bidders Scope:

- a. This supply includes all indoor & outdoor equipment & electronics, Central Evaluators, Detection points with cable, reset box (if required), LV/Co-operation boxes (if required), racks, Communication equipment/ interface equipment for connecting evaluators as applicable to the scheme, required cards, Ethernet switches/modems/auto-media converter, multiplexer etc. with all the accessories including dust free cabinets, racks fixtures, SPDs, mounting arrangements, deflectors plates, housing of track side electronics etc. Any other miscellaneous materials required for picking up the final track relay & resetting the section and to fulfill the requirements laid in the technical details above or RDSO or OEM specification/documents, shall be supplied by the bidder.
- b. If any housing like Tracksid junction boxes is required to keep outdoor equipment, it must be supplied with the equipment with no extra cost.
- c. The material will be supplied at the consignee store. For installation, same will be transported to the site by the bidder at his own cost, installed and balance material (if any) be returned to consignee store. The safeguarding of the equipment from the moment it is issued to the bidder till its commissioning or return to the Railway store shall be the bidder's responsibility.
- d. The tender should Submit the Design & drawings as per SECR practices of MSDAC as per approved SIP.
- e. Installation, testing and commissioning of MSDAC through OEM's engineer as per approved drawings, OEM's practices, RDSO specifications/TAN and SECR instructions. After the commissioning the OEM staff should halt at site for minimum 72 Hrs for attending any abnormalities.
- f. Pre-commissioning check list issued by RDSO for MSDAC will be prepared by the OEM's engineer and to be signed jointly with Railway site engineer.
- g. Installation, testing and commissioning of MSDAC also includes:
 - 1. Laying of HDPE Duct pipe & laying of sensor cable inside that from location box/ junction box to DP, Fixing the DP on the track including drilling (if required), making its terminations, fixing of deflector plates including drilling (if required) and installing/fixing of any other outdoor component like mushroom etc. HDPE Duct pipe for that purpose will also be supplied by the bidder.
 - 2. Wiring of Central evaluator from CT rack, Power supply wiring, wiring for reset arrangement of MSDAC.
 - 3. Painting and writing work outdoor & indoor as per the site requirement.
 - 4. Providing Earthing and Surge Protection arrangement for the MSDAC outdoor as well as indoor electronics as per the requirement of OEM. The supply and installation of Maintenance free earthing or double rail earth arrangements (as recommended

by OEM/RDSO) for the earthing of track side electronics or DP must be done by the bidder and no separate payment will be made.

5. Any other item mentioned in the OEM installation manual, RDSO documents, SECR practices & Pre commissioning checklist should be supplied & installed by the bidder and no separate payment will be made.
- h. Supply & Installation of remote diagnostic system with monitoring software at centralized location and connectivity from evaluator to Diagnostic terminal.
- i. All the power cables should be laid in PVC pipe with proper separation from other cables.
- j. Training of Railway Officers, Supervisors and Technicians.
- k. Providing potential free contacts for monitoring of equipment by data logger for the parameters mentioned in the technical details & RDSO specification.
- l. All the sundry materials required for installation and commissioning of system shall be supplied by the bidder at its own cost.
- m. Complete set of documents (Instruction manuals, installation manual & maintenance manuals including DO's Don'ts, schematic block diagram troubleshooting manual, pre-commissioning check list and other technical information etc).
- n. Any Item not specifically mentioned in Railways scope will be part of bidder's scope.
- o. All empty slots in card file shall have dummy plates fitted to prevent entry of lizards etc.
- p. Supply & installation of failure diagnostic & maintenance templates of suitable size that needs to be stucked near the installed rack.

3. Railways Scope:

- a. Providing Approved SIP and approval of MSDAC design.
 - b. The length of cable required with each track device/DP will be provided to tenderer at latter stage while issuing the RDSO call letter.
- 4. Defect Liability Period:** Defect liability (warranty) period will be one year. One year will be counted from the date of commissioning of each block section. The Bidder shall remain responsible to arrange for replacement and for getting it repaired at his own cost.

Remote diagnostic system for MSDAC

Supply & Installation of remote diagnostic system at centralized location includes.

1. Furniture at least 1 executive Table Godrej Finesse 4020 or similar and 2 executive Chair Godrej Aero Full Back or similar.
2. Diagnostic terminal (intel i7 12gen, 8GB RAM, 500GB SSD, DVD RW, 1GBPS LAN, WIFI, 4 Nos USB port, with Mouse & Keyboard with window 11 or higher specification, make: HP/Lenovo/dell).
3. Display of 55" 4K (Sony/Samsung/LG make).
4. Monitoring software and connectivity from evaluator to Diagnostic terminal
5. Color Laser printer, power backup of 3 Hours & Along with necessary accessories as per OEM recommendation.
6. Above mentioned is basic minimum requirement however system shall be as per actual requirement stated and approved by engineer in-charge prior to supply.

Calculation of EI Bits

For the New EI the payment will be done as per number of Vital Bits and for the alteration of EI the payment will be done as per number of routes altered as per the schedule of the tender. For simplification & clarity for counting the Bits & Routes the following scheme is adopted. Note that the following calculation scheme is only for payment, and it does not restrict the execution of work in any way or prohibit to include necessary Bits or alter necessary routes for safe working of the system. The tenderer must execute all the necessary Bits & alter necessary routes which is required for the normal & safe working of the equipment as per the prevailing guidelines.

- 1. Calculation of BITS:** For the EI schedule, where payment is done Bits wise, only functional VITAL BITS will be considered for payment. The functional Vital Bit list is attached for reference. System related bits including Counter bits, non-vital bits & Read back bits etc. shall not be counted. The System shall have provision for accommodation of additional 15% of I/O in future as per RDSO specification.

SN	Description of Signalling Gears	Name of Relay/Function/ Bit
1.	Signal	HR, HHR, DR, RECR, HECR, HHECR, DECR
2.	Aspect control/sequencing	ECPR, OFFECPR, HHDECPR, UECBPR
3.	Route Indicator	UHR, UECR
4.	Signal- Calling On	COHR, COECR
5.	Signal- Shunt (Dependent)	ShHR, ShECR (OFF)
6.	Signal- Shunt (Independent)	ShHR, ShECR (ON), ShECR (OFF)
7.	Track Circuit	TPR
8.	Track Section (MSDAC)	XTPR, RSR, RAR
9.	Points	WNR, WRR, WCR, TPZR, NWKR, RWKR, WLR
10.	LC Gate (Interlocked)	LXLR, LXKR, LXERR, ESRR, ESNR, RR
11.	Crank Handle	CH_KT(IN)PR, CH_RPR
12.	Directional setting	GNR, DSR_INT, DSR_REL, DSPR, DSR
13.	A/AG Marker (Automatic Signal)	AMHR, AMHECR, AGMHR, AGMHECR
14.	Slot	YR, YSR, AR1, AR2
15.	Automatic signalling control	HBPR, AR, AWR
16.	Other BITS	SMCR, ECHRBPR
NOTE: These are minimum vital input/output functions to achieve logical circuits in EI. In case circuit diagrams have other than above vital input/output bits, it shall be considered and paid with the approval of the Railway Engineer in-charge of the work (Dy. CSTE).		

List of items in specialized Tool Kits for each station supplied by Contractor/OEMs**(a) List of items contained in Siemens Make Tool Kit for MSDAC**

Sl.	Item	Siemens Make
1	Digital Multimeter, Fluke-289	01 No.
2	Torque Wrench, 25-135 N/Mtr	01 No.
3	Set of Spanners	01 No.
4	Screw Driver Small, No 922	01 No.

5	Screw Driver, T 20L	01 No.
6	Soldering Iron	01 No.
7	Dummy Wheel	01 No.
8	Marking Jig for 52kg & 60kg Rail	01 Each
9	Card Puller	01 No.
10	Adapter Card	01 No.
11	Micro Processor Based Data Analyzer: Data Analyzer for downloading data from event logger- 1 no. make Dell Inspiron 15 5559 (Y566509HIN9) model or similar, having configuration:- (a) 6th generation intel core i5-6200U processor, clock speed- 2.3 GHz (b) Memory – 8GB, DDR3 RAM. (c) Operating system - Windows 10, 64-bit. (d) HDD capacity - 1 TB SATA 5400 RPM speed (e) Display size -15.6 inch LED(1366 X 768) pixel resolution, (f) Antivirus - 12 month subscription, (g) USB 2.0 Slot – 2, USB 3.0 Slot – 1, HDMI-1 (h) Battery - 4 Cell Li-ion battery, (i) warranty - 1 Yr, Retail Supplied Accessories - Leather carry Bag,	01 No.
12	Plier (Nose, Mini Nose, Cutting, & Combination)	01 Each
13	Nut Driver	01 No.
14	Wire Stripper	01 No.
15	Soldering Wire	01 No.
16	IC Cutter	01 No.

(b) List of items contained in Frausher Make Tool Kit for MSDAC.

Sl.	Item	Frausher Make
1	Digital Multimeter, Fluke-289	01 No.
2	Torque Wrench, 25-135 N/Mtr	01 No.
3	Set of Spanners	01 No.
4	Screw Driver Set	01 No.
5	Soldering Iron	01 No.
6	Dummy Wheel	01 No.
7	Micro Processor Based Data Analyzer: Data Analyzer for downloading data from event logger- 1 no. make Dell Inspiron 15 5559 (Y566509HIN9) model or similar, having configuration:- (a) 6th generation intel core i5-6200U processor, clock speed- 2.3 GHz (b) Memory – 8GB, DDR3 RAM. (c) Operating system - Windows 10, 64-bit. (d) HDD capacity - 1 TB SATA 5400 RPM speed (e) Display size -15.6 inch LED(1366 X 768) pixel resolution, (f) Antivirus - 12 month subscription, (g) USB 2.0 Slot – 2, USB 3.0 Slot – 1, HDMI-1 (h) Battery - 4 Cell Li-ion battery, (i) warranty - 1 Yr, Retail Supplied Accessories - Leather carry Bag,	01 No.
8	Plier (Nose, Mini Nose, Cutting, & Combination)	01 Each
9	Nut Driver	01 No.
10	Wire Stripper	01 No.
11	Soldering Wire	01 No.

(c) List of items contained in IPS Tool Kit.

Sl.	Item	Amararaja Make
1	DE Spanner 10-11	01 No.
2	DE Spanner 6-7	01 No.
3	DE Spanner 8-9	01 No.
4	DE Spanner 12-13	01 No.
5	Box Spanner 6-7	01 No.
6	Box Spanner 8-9	01 No.
7	Box Spanner 10-11	01 No.
8	Box Spanner 12-13	01 No.
9	Cutting Plier 6"	01 No.
10	Nose Plier 6"	01 No.
11	Screw Driver Set (5 Pieces) 6"	01 No.
12	Screw Driver Small/Aligner	01 No.
13	Screw Driver Big 12"	01 No.
14	Plier 6"	01 No.

(d) List of items contained in IPS Tool Kit.

Sl.	Item	Statcon Make
1	DE Spanner 6-7	01 No.
2	DE Spanner 8-9	01 No.
3	DE Spanner 10-11	01 No.
4	DE Spanner 12-13	02 No.
5	Box Spanner 6-7	01 No.
6	Box Spanner 8-9	01 No.
7	Box Spanner 10-11	01 No.
8	Box Spanner 12-13	01 No.
9	Spring cutter	01 No.
10	Screw Driver Set (5 Pieces) 6"	01 No.
11	Screw Driver 937	01 No.
12	Plier 6"	01 No.
13	Aligner	01 No.
14	Nose Plier 6"	01 No.

(e) List of items contained in IPS Tool Kit.

Sl.	Item	HBL Make
1	Ring Spanner 6x7, 8x9, 10x11, 12x13 MM	01 Set
2	Flat Spanner 6x7, 8x9, 10x11, 12x13 MM	01 Set
3	Nose Plier 6"	01 No.
4	Screw Driver Set 713, 827, 901, 911, 912, 921	01 Set
5	Wire cutter 6mm	01 No.
6	Plier 165mm	01 No.
7	Multimeter Probe (Red & Black) 2 mtr length.	01 Set

(f) List of items contained in Electric Lifting Barrier Gate Tool Kit (Heidz).

Sl.	Item	Qty.
1	Screw Driver, 786	01 No.
2	Screw Driver, 353	01 No.
3	Circlip Plier	01 No.
4	Alain Key	01 No.
5	DE Spanner Set (4 Nos)	01 Set
6	Nut Driver, 11	01 No.
7	Nut Driver, 17	01 No.

(g) List of items in Toolkit of point machines.

Sl.	Item	Qty.
1	DE spanner 30-32	01 No.
2	Single Ended spanner	01 No.
3	Screw Driver 300 mmlong	01 No.
4	DE spanner 18-19	01 No.
5	Socket spanner with Socket -13mm,17mm, 19 mm, 20mm	01 Set

(h) EI Tool Kit: The supply of EI system must include one set tool kit for each station.

Sl.	Item	Qty.
1	True RMS digital multimeter 4-1/2 digit suitable for 50Hz, high accuracy	01 No.
2	Handheld Service terminal/ Portable service terminal for data input and configuration, simulation and functional testing, diagnostic & trouble shooting and commissioning of EI System: Intel EVO certified, i5-13 gen Processor, Windows 11, 14" FHD Display, 8 GB RAM, 512 GB SSD, FHD Camera with microphone, 1 HDMI, Min 1 Nos of USB -C, 1 USB (type-A), MicroSD Card Reader, 1 Headphone/Mic Combo, Backlit keyboard, Stereo speakers, Wi-Fi 6, Bluetooth with Microsoft Office. Make: Samsung/Dell/HP/Lenovo. Including all types of necessary connectors (such as USB to RJ45, USB to RS 232 etc.) & accessories to be supplied	01 No.
3	HARTING HAND CRIMP Tool	01 No.
4	HARTING 48 PIN Insertion tool	01 No.
5	HARTING CRIMP Insert FC1	01 No.

6	HARTING 48 PIN Removal Tool	01 No.
7	HARTING 96 PIN Insertion tool	01 Set
8	HARTING 96 PIN Removal Tool	01 No.
9	Screw Driver set	01 No.
10	Wire stripper	01 No.
11	Cutting Plier	01 No.
12	Allen key set	01 No.
13	Soldering iron	01 No.
14	USB to serial converter	01 No.
15	Nose Plier	01 No.
16	Torch Imported	01 No.
17	Brush	01 No.
18	Tester	01 No.
19	Boot Lug Crimp tool	01 No.
20	Micro logic Crimp tool	01 No.
21	Blower	01 No.
22	BACK Pack heavy	01 No.
23	Any other tools/instrument etc. prescribed by OEM/RDSO	

(I) List of items contained in CEL make Tool Kit for SSDAC:

Sl.	Item	Siemens Make
1	Pure sine wave Digital multi meter make Fluke model/ Rishabh model 285 or 6016, Kusum Meco model 859CF or Equivalent.	01 No.
2	Dummy Wheel (as Per Drg. No. L007750A3, D14)	01 No.
3	Ring spanner 17-19, 24-26	01 No. each
4	Open end spanner 17-19, 24-26	01 No. each
5	Socket spanner with handle	01 No.
6	Torque wrench (jaicom JPR65 or equivalent, 88 NM)	01 No.
7	Screw Driver No. 902	01 No.
8	Screw Driver No. 935	01
9	Marking Jig for drilling (Drg No. f008300, on D29 & D29A)	01 No.
10	Dummy load to check power supply (resistive)	01 No.
11	Train simulator, model TS267P CEL make	01 No.
12	Extender card (Card No. 557 or latest)	01 Each
13	Micro Processor Based Data Analyzer: Data Analyzer for downloading data from event logger- 1 no. make Dell Inspiron 15 5559 (Y566509HIN9) model or similar, having configuration:- (a) 6th generation intel core i5-6200U processor, clock speed- 2.3 GHz (b) Memory – 8GB, DDR3 RAM. (c) Operating system - Windows 10, 64-bit. (d) HDD capacity - 1 TB SATA 5400 RPM speed (e) Display size -15.6 inch LED(1366 X 768) pixel resolution, (f) Antivirus - 12 month subscription, (g) USB 2.0 Slot – 2, USB 3.0 Slot – 1, HDMI- 1 (h) Battery - 4 Cell Li-ion battery, (i) warranty - 1 Yr, Retail Supplied Accessories - Leather carry Bag,	01 No.

Annexure-D

Supply of supervisory console:

Operating System - Windows 10 Home, Processor - Intel® Core™ i5-8400T (1.7 GHz base frequency, up to 3.3 GHz with Intel® Turbo Boost Technology, 9 MB cache, 6 cores)) (8th Generation Intel® Core™ i5 processor), Memory - 8 GB DDR4-2400 SDRAM, 500GB SSD, Wireless Mouse, Wireless Keyboard with volume control, Display- 42" diagonal FHD smart or higher, Warranty- 3-year limited parts, labour and on-site service, toll-free technical phone support for the first 30 days., Security and Protection (Antivirus) - Protect your PC from dangerous online threats for 1 year validity. pen drive- 32 GB of reputed make, UPS- 1 KVA UPS with 30 min. backup make APC, model no BR1000 G IN; printer- Epson L110 or HP LaserJet Pro P1108; computer table- model C10, make Godrej size 600mm x 450mm x 750mm; computer chair-model

CH-1004 make Godrej size- 46 cm x 59.5 cm x 82 cm and 46 cm seat height.

Annexure-E

Specifications for Cable Fault Locator:

1. The instrument should be able to locate the open, short, load coils, bridge taps/laterals, cross, splice/joint faults in copper /metallic cables faults.
2. It should have zoom function.
3. It should measure distance to fault in meters, feet or time.
4. It should have menu push buttons to navigate through the cable length.
5. It should have Facilities to select cable type from built in menu or create custom cable types, with preset parameters including Vop. Pulse width, VP, gain, and vertical position are automatically selected.
6. It should have Cloning feature: Cable Tables/Settings should be possible to be 'cloned' via SD/USB Card from one TDR unit to another.
7. It should have Instrument should contain help button for guiding the operator on control and displayed values.
8. Make: Stanlay, 3M, Asian contact & Greenlee:
9. Additional parameter as per below table:

Output Pulse:

Test Signal, Type 1/2 sine wave, Width (ns)-1,5,25, Impedance(Ω)-75, Voltage >4V peak

Input:

Safety Protection +/- 400VDC, Filtering 1, 2, 4, 8, 16, 32

Performance:

Horizontal Resolution- 204 fps (0.075m), Dead Zone (m)- 0, Accuracy (ps)- $\pm 0.01\%$, ± 300 , VOP- Fully adjustable from 0.250 to 1.000, Vp Factor (%) 0.1, Gain (dB) 0 to 90, Intermittent Fault Location- Yes, Maximum Distance (Kf)- 12, Display Types- Color display, sunlight, Display Resolution- 800 X 480, Display Size- 7 inches, Backlight Brightness- 1000, Testing Type- Manual & Auto, Test Result Storage- 62500 traces (SD card: 8GB), Setting Storage- 29 cables preloaded (space, External Communication- USB, Battery Type- Rechargeable Li-Ion battery, Battery Capacity- 30Wh; sufficient for >8 hr use, Battery Life- Battery management system, Operating/ Storage- 0 to 50 / -20 to 70, Certification- CE certified.