



BEML LIMITED
BANGALORE
R & D CENTER

Doc No.	GR/TD/4152
Date	31.10.2020
Rev. No	2
Page	1/9

Technical Specification –
CCTV surveillance system for 8W CMV DMRC with
Crane and lifting Platform

	Name	Date	Signature
Approved By	SYLAJA V	31.10.2020	SD/-
Checked By	JAYARAMU S	31.10.2020	SD/-
Prepared By	JITENDRA YADAV	31.10.2020	SD/-

	Technical Specification for CCTV surveillance System for 8W CMV DMRC with crane & Lifting Platform	Doc No.	GR/TD/4152
		Date	31.10.2020
		Rev. No	2
		Page	3/9

Table of Contents

1. Introduction	4
2. Climatic Conditions	4
3. Scope of Supply.....	5
4. Coverage Area	6
5. Design Information	7
6. Installation, Commissioning & Testing.....	8
7. Operation and Maintenance Manual.....	8
8. Spare parts, Special Tools and Testing Equipment.....	8
9. DLP & Warranty.....	8
10. Training.....	9
11. Attachments.....	9

	Technical Specification for CCTV surveillance System for 8W CMV DMRC with crane & Lifting Platform	Doc No.	GR/TD/4152
		Date	31.10.2020
		Rev. No	2
		Page	4/9

1. Introduction

This document describes the **CCTV surveillance System** to be supplied for Catenary Maintenance Vehicle (8 W CMV). BEML shall carry out all required works and activities as Supplier for Catenary Maintenance Vehicle (8 W CMV) contract while the Subcontractor shall be responsible for all works required in this PTS with regard to Design, supply, testing and commissioning of **CCTV surveillance System** and shall be responsible for supporting the BEML activities as subcontractor for Catenary Maintenance Vehicle (8 W CMV).

2. Climatic Conditions

The 8W CMV shall operate reliably and safely under the following atmospheric and climatic conditions.

Description	Limiting Values
Ambient temperature	0°-55° C
Altitude	Sea level to 600m
Humidity	49 to 100%
Max. Temperature in Sun	75°C
Vibration	The equipment, Subsystem and their mounting arrangements shall be designed to withstand satisfactory vibrations and shocks encountered in service.
Rainfall	The rainfall is fairly heavy and during the dry weather the atmosphere is very dusty. The car should be able to negotiate waterlogged track with water level about 100 mm above the rail top for which the equipment should be suitably designed.
Wind speed	High wind speed in certain areas, with wind pressure reaching 150 kg/m ²
Environmental Condition	The CCTV system shall be such design and manufacture, that it has demonstrated proven & satisfactory performance in climate which prevails in Delhi, India
Vehicle Speed (at which view to be captured)	0-30 KMPH.

	Technical Specification for CCTV surveillance System for 8W CMV DMRC with crane & Lifting Platform	Doc No.	GR/TD/4152
		Date	31.10.2020
		Rev. No	2
		Page	5/9

3. Scope of Supply

The scope of the CCTV System shall at least include the following

Sl. No.	ITEM DESCRIPTION	Qty / Car
1	Surveillance Camera on roof, Digital type, Capable of capturing images in night times having protection IP 66 as per Attachment 1 and 2.	4 Nos.
2	Recorder (1TB HDD, 2GB RAM) as per Attachment 3.	1 set
3	10 inch Monitor screen as per Attachment 4 or equivalent.	2 Nos.
4	Application Software	1 Set
5	Male and Female connector, pin and socket, etc. along with special cables (L=250 Mtrs)	1 Set
6	Spare parts, special tools and testing equipment.	1 Set
7	Power supply unit to work from 110 V DC as per Attachment 5 or equivalent.	1 No.

- i) The subcontractor shall provide camera mounting brackets with hardware, software tool, inter connecting cable etc., for downloading of data from Recorder through laptop PC.
- ii) The driver shall be able to retrieve, monitor and playback images from the system without affecting any of the recording functions.
- iii) The views gathered from each of the camera located on the roof shall be played simultaneously on split window of the monitor screens of both the cabs. Adequate controls shall be provided for necessary surveillance requirements and priorities.
- iv) All recording shall have the associated camera unique identifier time and date information stamped and super imposed onto the video image. Facilities to recover any recordings using time and date request shall be implemented.
- v) The CCTV system shall fully meet the requirement of EMI/EMC as per standard EN 50121-3-2.
- vi) The subcontractor shall provide valid type test certificates/documents and

	Technical Specification for CCTV surveillance System for 8W CMV DMRC with crane & Lifting Platform	Doc No.	GR/TD/4152
		Date	31.10.2020
		Rev. No	2
		Page	6/9

routine test certificates for the CCTV system aggregates.

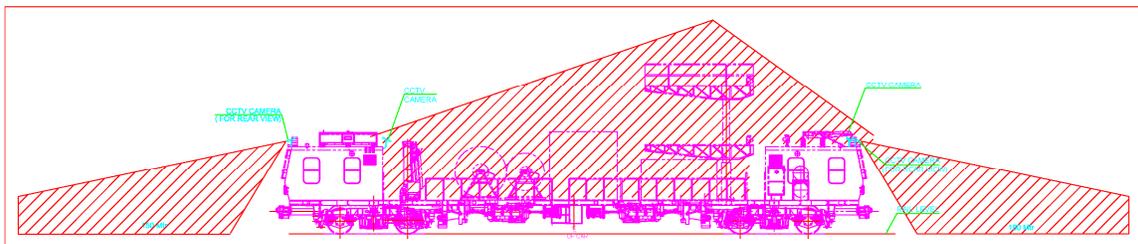
- vii) The subcontractor shall be fully responsible for integrated testing and commissioning of the CCTV system at BEML / works and at customer (DMRC) site.
- viii) The subcontractor shall provide relevant hardware such as brackets, bolts, nuts, washers and other fasteners required for installation.
- ix) The subcontractor shall provide following documents.
 - a) Description of CCTV system aggregates with drawings.
 - b) Type test and Routine test reports
 - c) Operation and maintenance manual
 - d) Spare parts catalog
- x) The subcontractor shall provide training in operation and maintenance to BEML / DMRC staff as per terms and conditions of the contract.
- xi) Submittals – Technical offer:

The sub contractor shall provide the following as the part of technical offer:

1) Technical offer for CCTV system

2) Clause wise comments against PTS - Doc no. GR/TD/4152

4. Coverage Area.



4.1 The CCTV system coverage area as shown above should cover minimum distance of 150 Mtrs and height of 2 Mtrs above rail level and also during forward/reverse movement of the CMV car at both the ends.

	Technical Specification for CCTV surveillance System for 8W CMV DMRC with crane & Lifting Platform	Doc No.	GR/TD/4152
		Date	31.10.2020
		Rev. No	2
		Page	7/9

4.2 The CCTV system should cover complete working area as shown above including height 2 mtrs above raised condition of lifting platform with 180 degree rotation at both the sides.

5. Design Information

The subcontractor shall provide BEML with all necessary documents, drawings, software, reports, calculations, technical data and similar documents of design, system assurance, quality assurance, manufacturing and testing with respect to PTS according to the time schedule defined by BEML for submission to obtain approval from concerned approving authority..

The drawings and documents shall be written in English with data format of respectively, latest AutoCAD release 14 and MS office version 7.0 (document - MS word, spread sheet — MS excel, data base files — MS Access, Presentation file — MS PowerPoint).

5.1 Design

The subcontractor shall comply with PTS and shall provide, but not be limited to, the following design information of the CCTV system

- (a) Product Description & Detailed Drawings for the following:
 - 1) Camera assembly
 - 2) Video recorder assembly
 - 3) Video monitor assembly
- (b) Standard applied to the CCTV system
- (c) Type test report
- (d) Routine test report
- (e) Certificate of conformity
- (f) Material certification
- (g) Spare parts catalogs
- (h) Training manual of special tools and test equipment
- (i) Training manual of the CCTV system

	Technical Specification for CCTV surveillance System for 8W CMV DMRC with crane & Lifting Platform	Doc No.	GR/TD/4152
		Date	31.10.2020
		Rev. No	2
		Page	8/9

(j) Operation and maintenance information for special tools and test equipment

(k) Dismounting and mounting instruction

6. Installation, Commissioning & Testing

The subcontractor shall support BEML for Installation, Commissioning & Testing of CCTV system at BEML works, Bangalore for all the cars.

The subcontractor shall support BEML for commissioning test of the CCTV system at depots of DMRC.

6.1 Commissioning Spares

The subcontractor shall provide commissioning spares and consumables in sufficient quantities to ensure the successful completion of the testing and commissioning activities at own cost.

7. Operation and Maintenance Manual

The subcontractor shall provide (3 sets / Car) of necessary hard copy and one set of soft copy of Operation and Maintenance Manual and Spare Parts Catalogues of the CCTV system. The Operating and Maintenance Manuals and Spare Parts Catalogues shall be provided for approval by BEML according to the time schedule approved by BEML..

8. Spare Parts / Special Tools / testing equipment

8.1 The Subcontractor shall provide all necessary spare parts / special tools and testing equipment for normal as well as operation and for maintenance purpose at the time of Supply of CCTV System to BEML.

9. Defect Liability period / Warranty

9.1 The Subcontractor warrants that all parts/equipments/components of the CCTV System shall be free from defects in the design, engineering, materials and workmanship of the Plant and Equipment supplied of the work executed.

9.2 The Subcontractor shall provide warranty for all parts/equipments/components of the CCTV System, for a period of twenty four (24) months from the date of successful Commissioning of the CMV Car.

	Technical Specification for CCTV surveillance System for 8W CMV DMRC with crane & Lifting Platform	Doc No.	GR/TD/4152
		Date	31.10.2020
		Rev. No	2
		Page	9/9

9.3 If during the warranty/defect liability period any defect should be found in the design, engineering, materials and workmanship of any parts/equipments/components of the CCTV System supplied or of the work executed by the Subcontractor, the Subcontractor shall promptly, in consultation and agreement with the Employer and or the Employer's Representative regarding appropriate remedying of the defects, and at Subcontractor's cost, repair, replace or otherwise make good (as the Subcontractor shall, at its discretion, determine) such defect as well as any damage to the any parts/equipment/components caused by such defect.

9.4 DLP Spares: The Subcontractor shall supply adequate quantity of contingent spare parts in order to minimize the shut down time due to repairs and maintenance at the time of supply of CCTV System. These spares are required to support the operation of the CCTV System for a period of two years from successful Commissioning by the Employer's Representative. During DLP all parts rendered defective shall be replaced by the Contractor.

10. Training

The subcontractor shall provide training to the BEML / DMRC personnel and the maintenance staff of DMRC on the operation and maintenance of CCTV system according to the training schedule and venue provided by BEML.

11. Attachments

Annexure – 1 CRIPTIX CPB - 50 VF – VARIFOVAL (Manual)

Annexure – 2 CRIPTIX – 30 VF – VARIFOVAL (Manual)

Annexure – 3 CRIPTIX DVR – 4CIP3

Annexure – 4 WORLDTECH – 9.5” TFT 977U

Annexure – 5 Mean well 150W Single Output DC-DC Converter SD 150 Series

Annexure – 6 Schematic Connections and Details

CRIPTIX – CPB-50VF (VARIFOCAL – Manual)

Power source	Regulated 12VDC
Power consumption	100mA IR LED
IR LED on power	10 pcs Max 275mA/ 15 pcs Max 320mA
Scanning system	Progressive scan sensor
Scanning frequency	NTSC 15.734KHz(H), 59.95KHz(V)/ PAL 15.625KHz(H), 50Hz(V)
Effective pixels	1305(h) x 1049(V)
Resolution	1200 TVL
OSD control	Control via cable (see OSD menu)
ACG /BLC	On
Noise Reduction	2d/3d Enabled
Sync System	Internal
Min. Illumination	0.01 Lux(AGC On, IE Off) / 0 Lux with IR LED On
Video output	1.0 Vp-p (75OHMs, composite)
S/N Ratio	More than 52db (AGC OFF)
Video Output	BNC Connector 1.0V p-p PAL /NTSC
Lens Mount	Fixed mount
Lens	Varifocal – 2.8mm to12mm @f 1.4
Operating temperature	-10 ^o +50 ^o C /- 40 ^o -122 ^o F
Operating humidity	0 – 90% (non-condensing)



KESARTRONIX, Nakoda Towers, 9, Narashingapuram Street, Chennai –600001

Tel : 044-42131970.Mob:+91 9840297855. kesartronix@gmail.com

CRIPTIX – CPD-30VF (VARIFOCAL – Manual)



Casing	In/Outdoor Weather Proof Metal Case
DNR	2D NR (Noise Reduction)
Dimensions	ϕ 131 x 93(H)mm
Lens	2.8-12mm 2 Mega Pixel Varifocal Lens
Operating Temperature	-10°C ~ +50°C RH95% Max
System Control	NTSC
Weight	0.80Kg
Effective Pixels	13MP 960P , 1200TVL
Scanning Area	Progressive Scan
IR LED	36PCS , Range Upto 100FT CDS Auto Control
Sync. System	Internal
Video Output	HD CVI (BNC) or 1200TVL Analog
Min. Illumination	0.001Lux
Resolutions	960P 1.3MP , 1200TVL
Electronic Shutter Speed	1/25s-1/50,000s , 1/30s` 1/60,000s
OSD (On Screen Display)	NO
White Balance	Auto
Gain Control	Auto



KESARTRONIX, Nakoda Towers, 9, Narashingapuram Street, Chennai –600001

Tel : 044-42131970.Mob:+91 9840297855. kesartronix@gmail.com

CRIPTIX – DVR- 4CIP3

ANNEXURE-3



4 Channel Standalone / Embedded Linux DVR	IP Camera Compatible - NVR
H.264 Video Compression	Triplex Function - Simultaneous Record, Playback, and Network Access
120 FPS Recording at 960H Resolution – IP/Analog CCTV Cameras	Supported Recording Modes: Schedule / Continuous / Motion / Alarm
1 VGA monitor output & 1 TV output	USB Flashdrive Drive Backup / Export
One Internal SATA Hard Drive (Up to 2TB)	4 BNC Video Inputs
1 RJ 45 input	4 Channel RCA Audio Inputs
1 Channel RCA Audio Output	Watch dog / Power Failure Recovery
Firmware upgrade via USB	USB mouse controlled
Dimensions: 330mm (w) x 220mm (D) x 50mm (H)	



KESARTRONIX, Nakoda Towers, 9, Narashingapuram Street, Chennai –600001

Tel : 044-42131970.Mob:+91 9840297855. kesartronix@gmail.com

WORLDTECH- 9.5" TFT977U



Features:

- Compatible with Security Camera, DVD, SD Card, Set-Top-Box, USB, CCTV Camera.
- Connect to Any TV with AV/RCA Output Port
- Connect to Any Set-Top-Box with AV/RCA Input Port
- Connect USB, TF CARD, Camera In, AUX Out.
- USB 2.0 Support.
- Ideal for AV/RCA Equipment.
- Touch Buttons on LED TV

Supported Formats:

- Can Read Media Files From USB Devices or TF cards.
- Videos Formats Supported: MPEG 1/ MPEG 2/ MPEG 4/ XVID/ H.26H/ H.263/ WMV9/ VC1/ RMVB/ MKV/ VOB/ PMP/ TS/ TP/ MOV/ MP4/ MP5 etc.
- Audio Formats Supported: MP3/ WMA/ OGG/ FLAC/ APE/ AAC/ AC3/ ATRAC/ DTS etc
- Image Formats Supported: JPEG/ BMP/ GIF/ PNF etc.
- Subtitles Formats Supported: SMI/ ASS/ SSA/ SRT/ SUB/ SUB+IDX/ TXT/ ISO/ DVD Navigation

Technical Standard:

- Brand: WORLDTECH
 - Model No.: WT-TFT 977U
 - Type: TV/ Media Player/ FM/ Music/ USB Media Player.
 - Input Voltage: 12V DC
 - AUX Output: Yes
 - AV Input: Yes
 - AV Output: Yes
 - Dimension : 300 x 290 x 70 (mm)
 - Weight : 1000 g
-



150W Single Output DC-DC Converter

SD-150 series

- Features :
- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage
- 1500VAC I/O isolation
- Built-in EMI filter, low ripple noise
- 100% full load burn-in test
- 24V and 48V input voltage design refer to LVD
- Low cost
- High reliability
- 2 years warranty

EAC CB (for D type only) CE

SPECIFICATION

MODEL	SD-150B-12	SD-150C-12	SD-150D-12	SD-150B-24	SD-150C-24	SD-150D-24	
OUTPUT	DC VOLTAGE	12V			24V		
	RATED CURRENT	12.5A			6.3A		
	CURRENT RANGE	0 ~ 12.5A			0 ~ 6.3A		
	RATED POWER	150W			151.2W		
	RIPPLE & NOISE (max.) Note.2	120mVp-p			150mVp-p		
	VOLTAGE ADJ. RANGE	11 ~ 16VDC			23 ~ 30VDC		
	VOLTAGE TOLERANCE Note.3	±1.0%			±1.0%		
	LINE REGULATION	±0.5%			±0.3%		
	LOAD REGULATION	±0.5%			±0.3%		
	SETUP, RISE TIME	2s, 50ms(only D mode) at full load					
HOLD UP TIME (Typ.)	24ms(only D mode) at full load						
INPUT	VOLTAGE RANGE	B:19 ~ 36VDC	C:36 ~ 72VDC	D:72 ~144VDC or 85 ~ 132VAC			
	EFFICIENCY (Typ.)	75%	77%	79%	77%	80%	
	DC CURRENT (Typ.)	8.5A/24V	4.2A/48V	2.1A/96V	8.5A/24V	4.2A/48V	2.1A/96V
	INRUSH CURRENT (Typ.)	D:22.5A/96VDC					
	LEAKAGE CURRENT	<0.75mA / 120VAC (SD-150D)					
PROTECTION	OVERLOAD	105 ~ 135% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	16.8V ~ 20V/10% LOAD			31.5 ~ 37.5V/10% LOAD Protection type : Hiccup mode, recovers automatically after fault condition is removed		
ENVIRONMENT	WORKING TEMP.	-10 ~ +60°C (Refer to output load derating curve)					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-20 ~ +85°C, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)					
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 4)	SAFETY STANDARDS	IEC60950-1 CB approved by TUV (for D type only), EAC TP TC 004 approved					
	WITHSTAND VOLTAGE	I/P-O/P:1.5KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC					
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH					
	EMI CONDUCTION & RADIATION	Compliance to EN55032 (CISPR32) Class B, EAC TP TC 020					
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,6,8; ENV50204, light industry level, criteria A, EAC TP TC 020					
OTHERS	MTBF	296.2K hrs min.(SD-150B)	289.9K hrs min.(SD-150C)	289K Hrs min.(SD-150D)	MIL-HDBK-217F (25°C)		
	DIMENSION	199*110*50mm (L*W*H)					
	PACKING	0.86Kg; 16pcs/14.5Kg/0.95CUFT					
NOTE	<ol style="list-style-type: none"> All parameters NOT specially mentioned are measured at 24,48,96VDC input, rated load and 25°C of ambient temperature. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. Tolerance : includes set up tolerance, line regulation and load regulation. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com) The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft). 						

Schematic of connections for DMRC

ANNEXURE-6

