

# Procurement Specification

Maker name : Advantech Co., LTD

Applicable product : DMS-SJ03(TREK-K01)

Part Number : 7826-49-1100

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**Revision history**

<i>Rev</i>	<i>date</i>	<i>Description</i>	<i>Approved</i>	<i>Author</i>
1.0	2017/6/8	Create 1 <sup>st</sup> version of document	Alex.Chen	Emily.Chiang

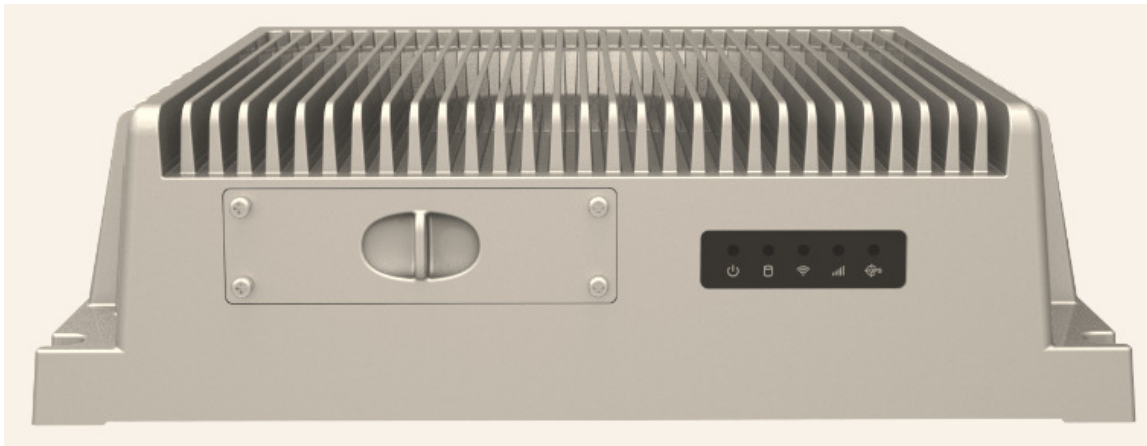
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## 1. Description

The number of "7826-49-1100" is a Dual-Core Compact In-vehicle Computing Box designed for Surveillance & Fleet Management (Advantech model name: DMS-SJ03) with Komatsu configuration setting. "7826-49-1100" is a key component in Komatsu's construction and mining vehicle. It will support Komatsu to integrate with their developed APPs in order to enhance existing functions. To be upgradable, to control friendly are crucial. Front side USB 2.0 port, SIM cards and SD card slots are designed for ease of maintenance.

It provides reliable recording and transmit images or alarms for remote monitoring over wireless, LTE, GNSS.



\*Front door is linked with product by belt inside.

Key features:

- Intel® Atom™ E3827 SOC
- Support Windows Embedded 7 System
- Built-in GNSS, WLAN, **Bluetooth (unusable on this product)**, and WWAN (with SIM card) modules
- Wide working temperature range (-30° C ~ 60° C), supports 12/24V
- Vehicle power (ISO 7637-2) and shock and vibration tolerant
- Intelligent vehicle power management system supports ignition on/off/ delay functions, wake-up event control, and system health monitoring
- and diagnostics
- Reserve the possibilities to upgrade feature with optional board
- Accessible SD card and SIM card with external door protection
- **IP65** design to adapt rigorous environment

**2. Specification**

This chapter shows the detail specification of the product which Komatsu will order by the parts number “7826-49-1100”.

Part Number	Reference Model
Komatsu (7826-49-1100)	DMS-SJ03-00A1E

**Computing Box HW Configuration:**

CPU	WWAN	WLAN	GPS	DRAM	Storage	2 <sup>nd</sup> Storage	O/S
Intel Atom E3827 (Baytrail-I, Dual Core, 1.75GHz)	Sierra Wireless AirPrime MC7455	Spark LAN WEPA-251N(BT)	u-blox MAX-M8Q	2GB (wide-temp.)	mSATA 16G SLC (wide-temp.)	Support SD 3.0 UHS-I mode	WES7P

**2.1 Electrical Specification**

Here is electrical specification for DMS-SJ03(TREK-K01). (Refer to TREK-674-HWB7B0E)

Model Name		DMS-SJ03 (TREK-K01) - Specification 7826-49-1000
Core	Processor	Intel Atom E3827 (Baytrail-I, Dual Core, 1.75GHz)

	<b>Memory</b>	1x SO-DIMM 2GB, Industrial grade.			
<b>Storage</b>	<b>Primary Storage</b>	1x mSATA 16GB, SLC , Industrial grade			
		<b>Secondary Storage</b>	1x SD card Slot (Behind the front door cover) Support SD 3.0, UHS-I mode. No SD card		
	<b>RF</b>		<b>GNSS</b>	Allows concurrent reception of two GNSS systems (GPS, GLONASS, BeiDou) uBlox MAX-M8Q 1x Waterproof (IP65) Female RP SMA Connector	
		<b>WLAN</b>		1x MiniPCIe Slot. SparkLAN WPEA-251N(B) : Industrial grade "802.11 a/b/g/n" 1x Waterproof (IP65) Female RP SMA Connector	
<b>WWAN</b>				1x MiniPCIe Slot. Sierrawireless MC7455 : 3G, LTE Design has to be compatible with 3.75G and LTE. 1x Waterproof (IP65) Female RP SMA Connector for main. 1x Waterproof (IP65) Female RP SMA Connector for LTE 2nd 1x Mini-SIM slot (Behind the front door cover)	
			<b>I/O</b>	<b>High density I/O Port. (Tyco AMP New connectors(Special) )</b>	Battery Power input 1 x Ignition input 1 x Din for update (Wake) 1 x Operating state output (System operating Lamp output) 3 x Dout : non Isolate DO1~DO3 (3 x Dout : isolate DO4~6 are optional) 4 x Din : non isolate DI1~4 (4 x Din : Isolate DI5~DI8 are optional) 1 x Power out (12V , 2A) 1 x VGA out (for test) 1x Mic in 1x Stereo Line in 1x Stereo Line out 2x CAN Bus. (3rd CAN Bus : optional) 1x 4-wire RS232
		<b>USB Ports</b>			1x Standard USB 3.0 Host Type A (Behind the front door cover) 1x Waterproof( IP64) USB 2.0 Host Type A
					<b>LAN Ports</b>

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		LAN 1-2(CN5): Gbit, W/O POE, MAC1(Switch), A-Code(3/8)
		LAN 1-3(CN3): Gbit, with POE, MAC1(Switch), X-Code(3/8)
		LAN 1-4(CN4): Gbit, W/O POE,, MAC1(Switch), X-Code(3/8)
	<b>Indicator LEDs</b>	5x LED (PWR(Red), Storage(Orange), WLAN(Green),WWAN(Green),GPS(Orange);
<b>Power</b>	<b>Reset Button</b>	1x Reset button (Behind the front door cover)
	<b>Voltage input</b>	20V - 30V (Can work at 9-32 VDC input , ISO 7637-2 compliant)
	<b>Leakage current at Ignition off</b>	Up to 10mA (without WWAN wake up condition)

**2.2 Environmental Specification**

Here is environmental specification for DMS-SJ03(TREK-K01).

<b>Environment</b>	<b>IP Rating</b>	IP65
	<b>Operating Temperature</b>	-30 degree ~ +60 degree
	<b>Storage Temperature</b>	-40 degree ~ +80 degree
	<b>Shock / Vibration</b>	Vibration: 6.8G, X,Y,Z=4h,4h,4h, 5 ~ 200 Hz, sweep; Shock: 100G
<b>Durability</b>	<b>MTBF</b>	B5 = 9000H
	<b>Moisture proof</b>	<i>moisture coating on PCBA</i>

**2.3 Regulations**

Here is the list of all regulation and approved level for DMS-SJ03(TREK-K01).

<b>Regulations</b>	<b>EMC</b>	"KES" standard (ISO13766, IEC 61000-4-2, IEC 61000-4-4, IEC 61000-4-6 compliant)
	<b>EMC</b>	(CE, FCC : option)
	<b>RF</b>	TELEC for Japan, (FCC ID, IC, CE, R&TTE : option)
	<b>Carrier</b>	JATE for Japan

Note: Per Komatsu’s request, Advantech will add a label on the chassis to show the mounted module of WWAN with JATE and TELEC regulation. Please refer to the Label list for the detail label content and drawing.

**2.4 Physical Specification**

Here is physical specification for DMS-SJ03(TREK-K01).

<b>Mechanical</b>	<b>Dimensions (W x H x D)</b>	287mm x 83mm x 180 mm,
-------------------	-------------------------------	------------------------

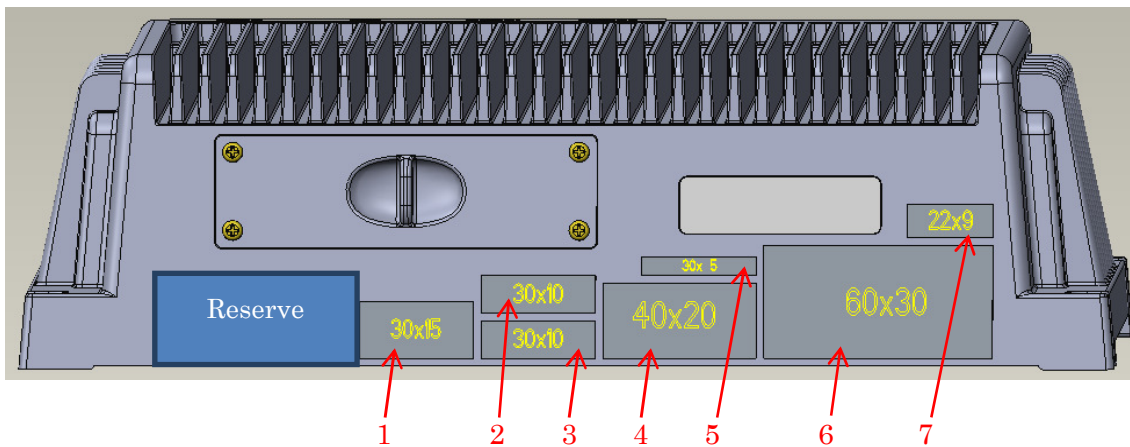
	<b>Weight</b>	3.5kg
	<b>Front door (I/O cover)</b>	Accessible, M3 Screw x 4

**2.5 Body Surface Specification**

Here is specification of body surface for DMS-SJ03(TREK-K01).

<b>Body surface</b>	<b>Housing Material</b>	Aluminum die-casting
	<b>Product label</b>	7. Windows license
		2. S/N w barcode (Code 128)
		3. P/N w barcode (Code 128)
		1. Komatsu Parts information w barcode (Code 128)
		6. Advantech information
		5. IMEI w barcode
4. Japan approval sheet		

Here is a concept image of label location for DMS-SJ03(TREK-K01).





Here is the label List for DMS-SJ03(TREK-K01).

Label number	Meaning	Drawing
2000027263	Advantech information	
2000027261	Japan approval sheet (JATE/TELEC)	
2000027262	Komatsu Parts information w barcode	

## 2.6 Shipping Specification

[New] Shipping specification

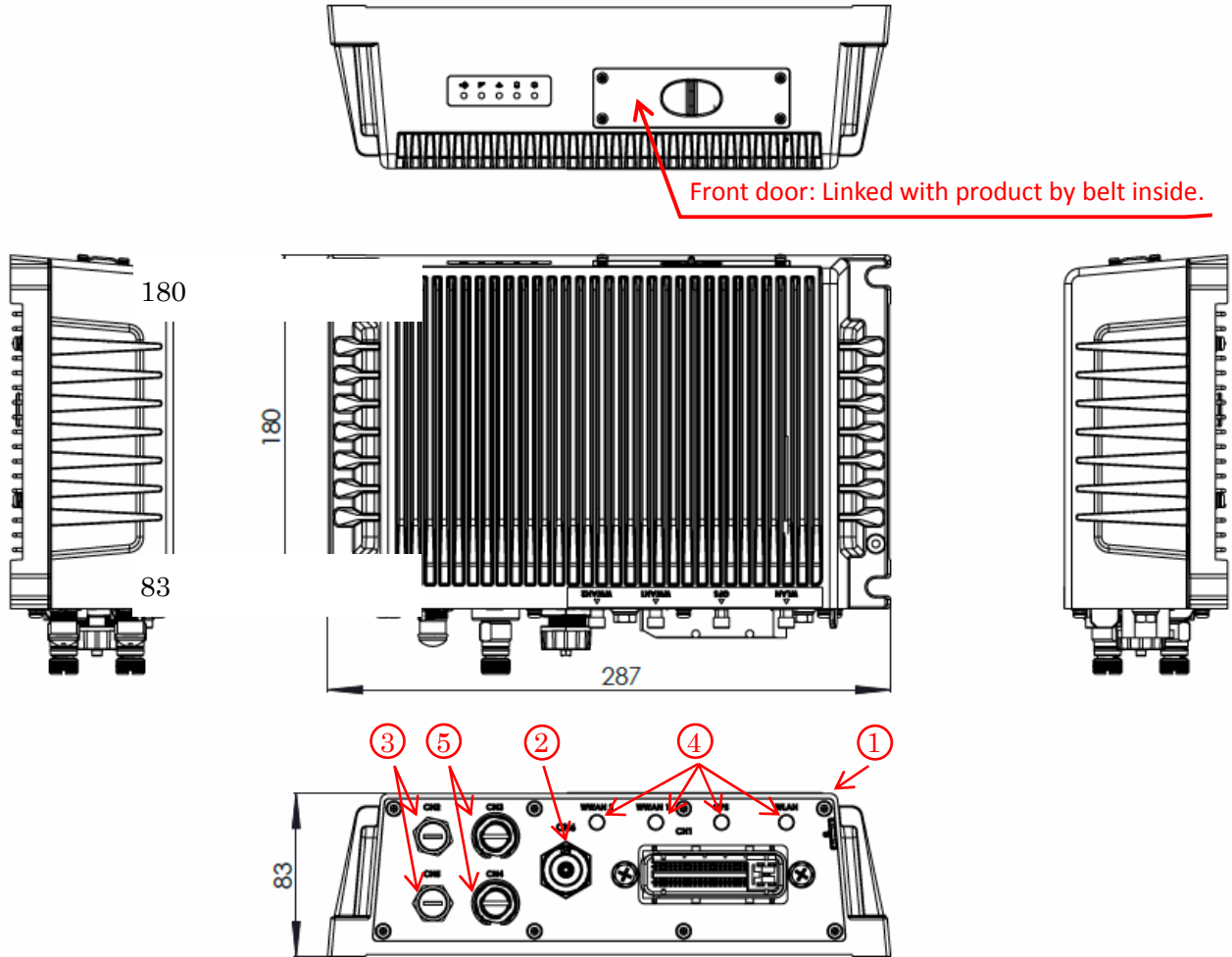
Accessory	Connector CAP	2 x M12 Plastic cover for A-code
		2 x M12 Metal cover for X-code
		1 x Metal USB connector cover
		4 x Rubber cover for SMA
Package	design	Drawing
	Package drop spec	80cm drop

## 3. Outline

### 3.1 Envelope Dimensions

Here is the outline dimension for DMS-SJ03(TREK-K01).

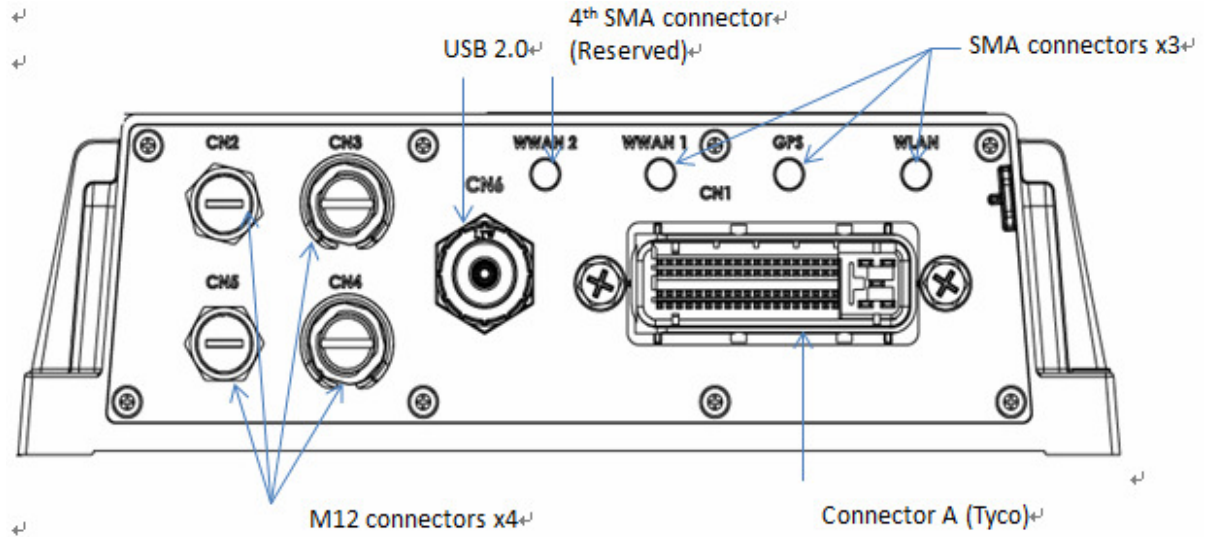
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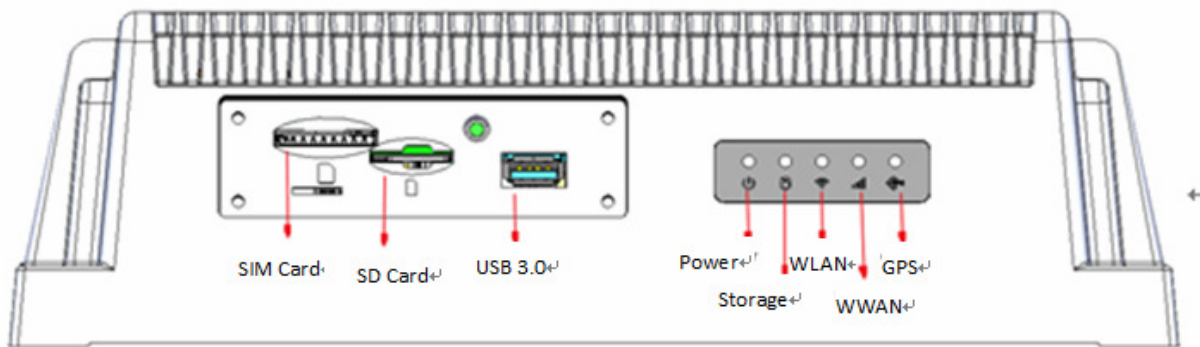
UNIT : mm

**3.2 Connector list and Pin list**

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Here is the proprietary connector list and pin-out information for DMS-SJ03(TREK-K01).



(connector type) TYCO 81PIN							
Pin	CN1	PIN TYPE	i/o	Pin	CN1	PIN TYPE	i/o
CN1-1	VCB	Power	i	CN1-41	GND	12VGND	-
CN1-2	GND_CAR	GND	-	CN1-42	V12	12V	o
CN1-3	-	-	-	CN1-43	V12	12V	o
CN1-4	VCB	Power	i	CN1-44	CRT_HS	Analog_signal	o
CN1-5	GND_CAR	GND	-	CN1-45	CRT_VS	Analog_signal	o
CN1-6	CRT_RED	Analog_signal	o	CN1-46	GND	GND	-
CN1-7	CRT_GREEN	Analog_signal	o	CN1-47	GND	GND	-
CN1-8	CRT_BLUE	Analog_signal	o	CN1-48	COM2_RTS	Signal	o
CN1-9	GND	GND	-	CN1-49	COM2_RXD	Signal	l
CN1-10	CAN2_H	Signal	i/o	CN1-50	GND	GND	-
CN1-11	CAN1_H	Signal	i/o	CN1-51	DO_03	Signal	o
CN1-12	GND	GND	-	CN1-52	D1_13	Signal	i
CN1-13	DO_01	Signal	o	CN1-53	GND_ISO	GND ISO	-
CN1-14	D1_11	Signal	i	CN1-54	DO_06	Signal	o
CN1-15	GND_ISO	GND ISO	-	CN1-55	D1_17	Signal	i
CN1-16	DO_04	Signal	o	CN1-56	GND_ISO	GND ISO	-
CN1-17	D1_15	Signal	l	CN1-57	LINEIN_DET	Signal(Reserved)	l
CN1-18	GND_ISO	GND ISO	-	CN1-58	LINEOUT_DET	Signal(Reserved)	o
CN1-19	GND	GND	-	CN1-59	MICIN_DET	Signal(Reserved)	i
CN1-20	LINE_IN_L	Analog_signal	i	CN1-60	GND	12VGND	-
CN1-21	RTL_FRONT_L	Analog_signal	o	CN1-61	GND	12VGND	-
CN1-22	GND	12VGND	-	CN1-62	GND	12VGND	-
CN1-23	V12	12V	o	CN1-63	GND	GND	-
CN1-24	V12	12V	o	CN1-64	GND	GND	-
CN1-25	GND	GND	-	CN1-65	5V_VGA	Signal	o
CN1-26	CRT_DDCDAT	Signal	o	CN1-66	GND	GND	-
CN1-27	CRT_DDCCLK	Signal	o	CN1-67	COM2_CTS	Signal	l
CN1-28	GND	GND	-	CN1-68	COM2_TXD	Signal	o
CN1-29	CAN2_L	Signal	i/o	CN1-69	GND	GND	-
CN1-30	CAN1_L	Signal	i/o	CN1-70	DO	Signal	o
CN1-31	GND	GND	-	CN1-71	D1_14	Signal	i
CN1-32	DO_02	Signal	o	CN1-72	D1N_UPDATE	Signal	i
CN1-33	D1_12	Signal	i	CN1-73	GND_ISO	GND ISO	-
CN1-34	GND_ISO	GND ISO	-	CN1-74	D1_18	Signal	i
CN1-35	DO_05	Signal	o	CN1-75	GND_ISO	GND ISO	-
CN1-36	D1_16	Signal	l	CN1-76	GND	GND	-
CN1-37	GND_ISO	GND ISO	-	CN1-77	GND	GND	-
CN1-38	MICIN	Analog_signal	l	CN1-78	GND	GND	-
CN1-39	LINE_IN_R	Analog_signal	i	CN1-79	GND	GND	-
CN1-40	RTL_FRONT_R	Analog_signal	o	CN1-80	GND	GND	-
				CN1-81	IGNITION	Signal	i

3-3) 締付トルク TIGHTENING TORQUE

CN2, 5 : 0.39~0.59Nm(CABLE SIDE), 0.30~0.40Nm(CAP)  
 CN3, 4 : 0.50~0.70Nm(CABLE SIDE), 1.85~2.15Nm(CAP)  
 SMA : 0.85~1.05Nm(CABLE SIDE)  
 FRONT DOOR: 0.45~0.60Nm(M3x4PLACES)

5	7826-49-1100-05	CAP, (COPPER ALLOY)	---	2	0.02	CAP-WBDFSMA2
4	7826-49-1100-04	CAP, (TPE)	---	4	0.00	HC-6DP-TSB
3	7826-49-1100-03	CAP, (PA)	---	2	0.00	21010000003
2	7826-49-1100-02	CAP, (ZINC ALLOY)	---	1	0.02	CAP-WACMSMA2
1	7826-49-1100-01	CONTROLLER	---	1	3.60	
INDEX	SYM.	PART NAME	MATERIAL	QTY/SET	MASS (kg)	REMARKS

**3.3 LED**

This chapter shows the spec of each LED status for DMS-SJ03(TREK-K01).

**(1) LED (Red) for power**

DC IN	LED		Scenario
O	Red	ON	Power source is external CAR battery
X	Red	OFF	System is off
O	Red	BLINK*1	Special for entering VPM bootloader mode.

Note: \*1. BLINK: Light 300msec and dark 300msec (period is 600msec).

**(2) LED (Yellow) for storage**

LED		Scenario
Yellow	BLINK*1	CF/HDD/SSD is active as device spec

Note: \*1. BLINK: It's used to indicate CF/HDD/SSD operational/activity status.

**(3) LED Green for WLAN/BT**

LED		Scenario
Green	OFF	WLAN/BT is off
Green	ON	WLAN/BT is on when WLAN link to LAN or BT is on

(4) LED Green for WWAN

LED		Scenario
Green	OFF	WWAN is off
Green	ON	WWAN is active as module spec

(5) LED (Yellow) for GPS

LED		Scenario
Yellow	OFF	GPS is off
Yellow	ON	GPS is active as module spec

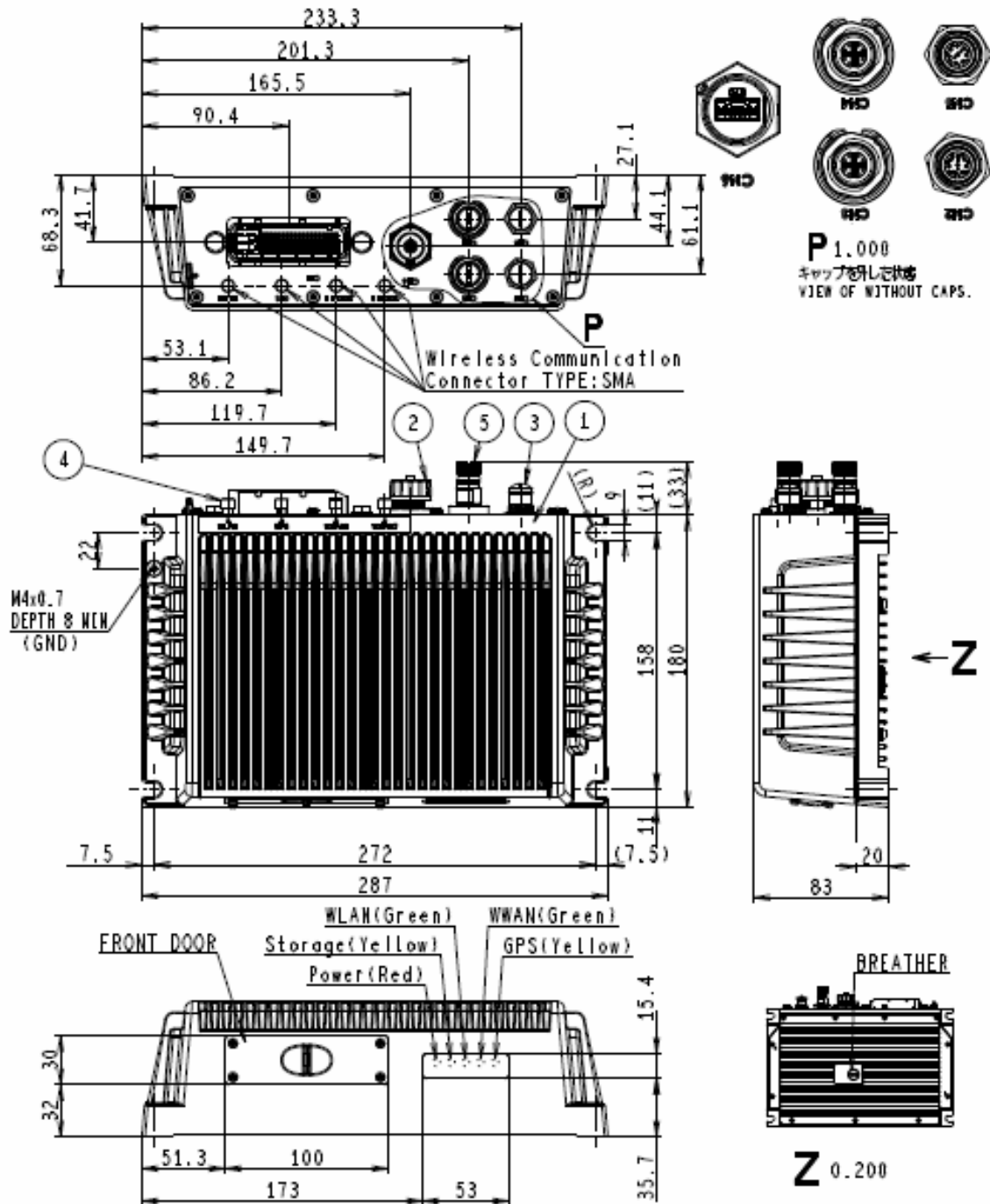
3.4 Packing specification

This chapter shows the packing specification for DMS-SJ03(TREK-K01).

研華股份有限公司 Advantech Co., Ltd.				編號 No.	M-07-TP1518		
名稱(Name):DMS-SJ03系列組包裝作業指導書(Ass'y & Packing SOP)				頁次 Page	30 of 31		
				版別 Ver.	T3		
站別 Station	作業名稱 Operation	標準工時 Working time	治工具 Fixture	扭力設定 Torsion			
包裝	包裝	0 秒 second	N/A	0 kgf-cm			
組裝程序 Procedure			  				
<p>1.用酒精清潔後貼上SMA mylar(1)，對齊紅線，如圖一</p> <p>1 Clean the appearance before attaching the SMA mylar(1) aligned with the red line as fig1 shown.</p> <p>2.機台入袋(2)，如圖二</p> <p>2 Place one unit into PE bag(2) as fig2 shown.</p> <p>3.用透明膠帶封好，如圖三</p> <p>3 Use a piece of tape to seal the PE bag as fig3 shown.</p>							
注意事項 Notes							
使用材料 Material							
項目 Item	料號 Part No.	材料規格 Description	數量 QTY	項目 Item	料號 Part No.	材料規格 Description	數量 QTY
1	1990029690T000	Label SMA connectors for DMS-SJ03	1				
2	2160002538	PE Bag 400Lx350Wx0.03Tmm clear	1				

研華股份有限公司 Advantech Co., Ltd. 名稱(Name):DMS-SJ03系列組包裝作業指導書(Ass'y & Packing SOP)				編號No.	M-07-TP1518		
				頁次Page	31 of 31		
				版別Ver.	T3		
站別 Station	作業名稱 Operation	標準工時 Working time	治工具 Fixture	扭力設定 Torsion			
包裝	封箱	0 秒 second	N/A	0 kgf-cm			
組裝程序 Procedure							
1.折外箱(1)，並於底部打兩釘，如圖一 1.Fold carton and seal the bottom in "T" shape with pieces of tape. Hit the nail 2.將包好的機台裝入EPE foam(2)(3)，如圖二 2.Install the EPE foam(2)(3) as fig2 shown. 3.將機台放入外箱，並以工字型封箱，如圖三 3.Put the unit into the carton as fig3 shown. 4.兩側貼上外箱貼紙，如圖四 4.Stick carton label on the both side of carton as fig 4 shown.		 <p style="text-align: center;">圖一</p>		 <p style="text-align: center;">圖二</p>			
		 <p style="text-align: center;">圖三</p>		 <p style="text-align: center;">圖四</p>			
注意事項 Notes							
外箱貼紙列印made in taiwan、垃圾桶							
使用材料 Material							
項目 Item	料號 Part No.	材料規格 Description	數量 QTY	項目 Item	料號 Part No.	材料規格 Description	數量 QTY
1	2100016209N000	Carton 350Lx255Wx150Hmm (7mm ADV A	1				
2	2130017842T000	Foam Right 255Lx150Wx88Hmm DMS-SJ03	1				
3	2130017841T000	Foam Left 255Lx150Wx88Hmm DMS-SJ03	1				

3.5 Detail drawing



4. Configuration

This chapter shows the configurations of 7826-49-1100 in order to specify the condition of Komatsu product.



**4.1 Software version**

This chapter shows software and firmware version information for DMS-SJ03(TREK-K01). The versions of software are divided into the software package which Advantech is managing inside.

<b>SW</b>	<b>OS</b>	Windows: WES7P- 32 bit (DMS-SJ03_V1.5.13.1.00b)
	<b>F/W</b>	BIOS: SJ03000IF30V110
		VPM: V000.096
		VCIL: V1.9
<b>SDK</b>	SDK: v4.0,8.0	

Note: Komatsu released approval letter, Advantech applied formal P/N for all these FW and O.S image and add them in the BOM (DMS-SJ03-00A1E) from PVT build.

**5. Inspection**

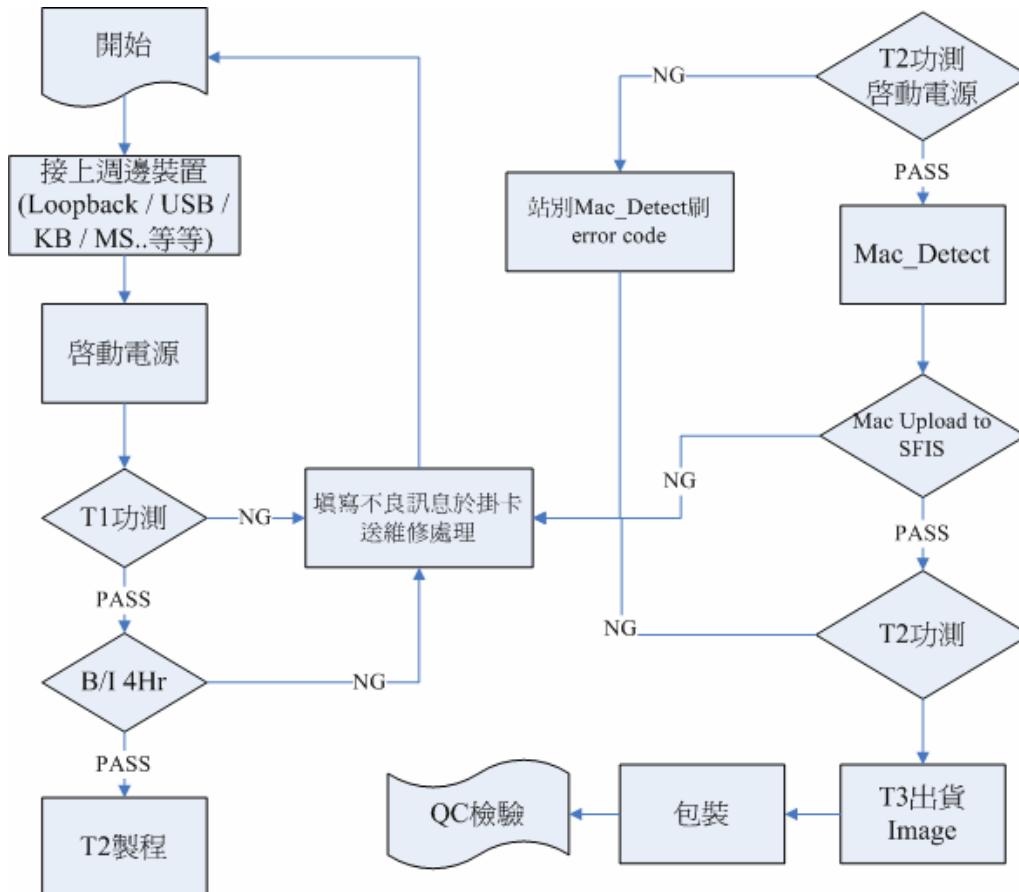
This chapter shows the inspection test items for each DMS-SJ03 in production phase.

**Standard test items for DMS-SJ03 production.**

\	<b>DMS-SJ03</b>
<b>2G RAM</b>	◎
<b>16G mSATA</b>	◎
<b>1.75GHz CPU</b>	◎
<b>Win 7</b>	◎
<b>USB Port</b>	◎
<b>Com Port</b>	◎
<b>LAN</b>	◎
<b>WLAN</b>	◎
<b>Audio</b>	◎
<b>CAN Bus</b>	◎
<b>GPS</b>	◎
<b>WWAN</b>	◎ MC7455
<b>DIO</b>	◎
<b>Din for update</b>	◎
<b>Power Out(12V)</b>	◎
<b>Ignition</b>	◎
<b>Operating state output</b>	◎

LED	◎
Reset button	◎
OS	Load O.S image WIN7

**Standard test flow for DMS-SJ03 production.**



**Note:**

1. T1= Function test;
2. B/I= Burn-in test (4 Hr);
3. T2= Function test;
4. T3= Load & Check O.S image before shipment

For the detail test methodology, please refer to “M-07-TT0578\_DMS-SJ03系列測試指導書-B0).pdf” to get more information.

***6. Warranties***

1. The warranty is conformed to the TRADING AGREEMENT between ADVANTECH and KOMATSU, ADVANTECH and Ryosan, KOMATSU and Ryosan.

## **7.FCC 警語**

### **7.1**

- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### **7.2**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### **7.3**

- Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

**AnnexA : Comport mapping table for DMS-SJ03**

DMS-SJ03		
	<b>COM mapping</b>	<b>F81866D</b>
PORT 1	COM1	<b>VPM</b> STM32F103
PORT 5	COM5	<b>GPS</b>
		<b>FT4232HL</b>
PORT 1	COM7	<b>CAN1</b> STM32F405RGT6
PORT 2	COM8	<b>CAN2</b> STM32F405RGT6
PORT 3	COM9	RS232 DB9(4 wire)
		<b>USB to WWAN</b>
Virtual PORT	COM13	WWAN_4G