Pole Star VMS

Installation Guide for IDP690
with Beijer T7A Operator Panel

Issue No: Draft V0.5
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Configuration Page

VMS-IDP690-MDT7A Installation Guide

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Summary: Installation guide for the Pole Star IDP690 transceiver with interconnection box and Beijer T7A operator panel.

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Amendment Record

ISSUE	DATE	UPDATES	AUTHOR
0.1	27th May 2013	First draft	Philip Lane
0.2	1st June 2013	Second draft with changes suggested by NS and CC.	Philip Lane
0.3	5th June 2013	Changes requested by JD and CC	Philip Lane
0.4	9th June 2013	Changes to diagrams	Philip Lane
0.5	12th June 2013	Changes requested by JD	Philip Lane

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- 1 x MAT-IDP690 satellite transceiver
- 1 x stainless steel mounting bracket for transceiver with 4 x M4 screws and self locking nuts
- 1 x Beijer T7A operator panel
- 1 x Keysonic ACK-540U+ keyboard for operator panel
- 1 x wall mount for operator panel
- 1 x Interconnection box
- 1 x 15 metre, 10-core cable (transceiver to interconnection box)
- 1 x 5 metre, 10-core cable (operator panel to interconnection box)
- 1 x 2 A fuse and fuse holder
- 1 x self amalgamating tape
- 2 x silicon grease sachets

You will need to supply:

- 24 V DC supply
- 2-core cable rated at least 2 Amps from DC supply to interconnection box

2. Safety Notice

The procedures in this guide must be observed during installation, operation, service and repair of this equipment. Failure to comply with these procedures violates safety standards of design, manufacture and intended use of this equipment. Pole Star Space Applications Limited assumes no liability for the customer's failure to comply with these procedures.

3. Description

The system consists of a MAT-IDP690 transceiver, a Beijer T7A operator panel and an interconnection box which connects them together and supplies them with power. The MAT-IDP690 is a SkyWave IsatData Pro satellite transceiver with integral GPS receiver, the Beijer T7A is a 400MHz ARM9 touch-screen operator panel. An overview of the system is shown in Figure 1.

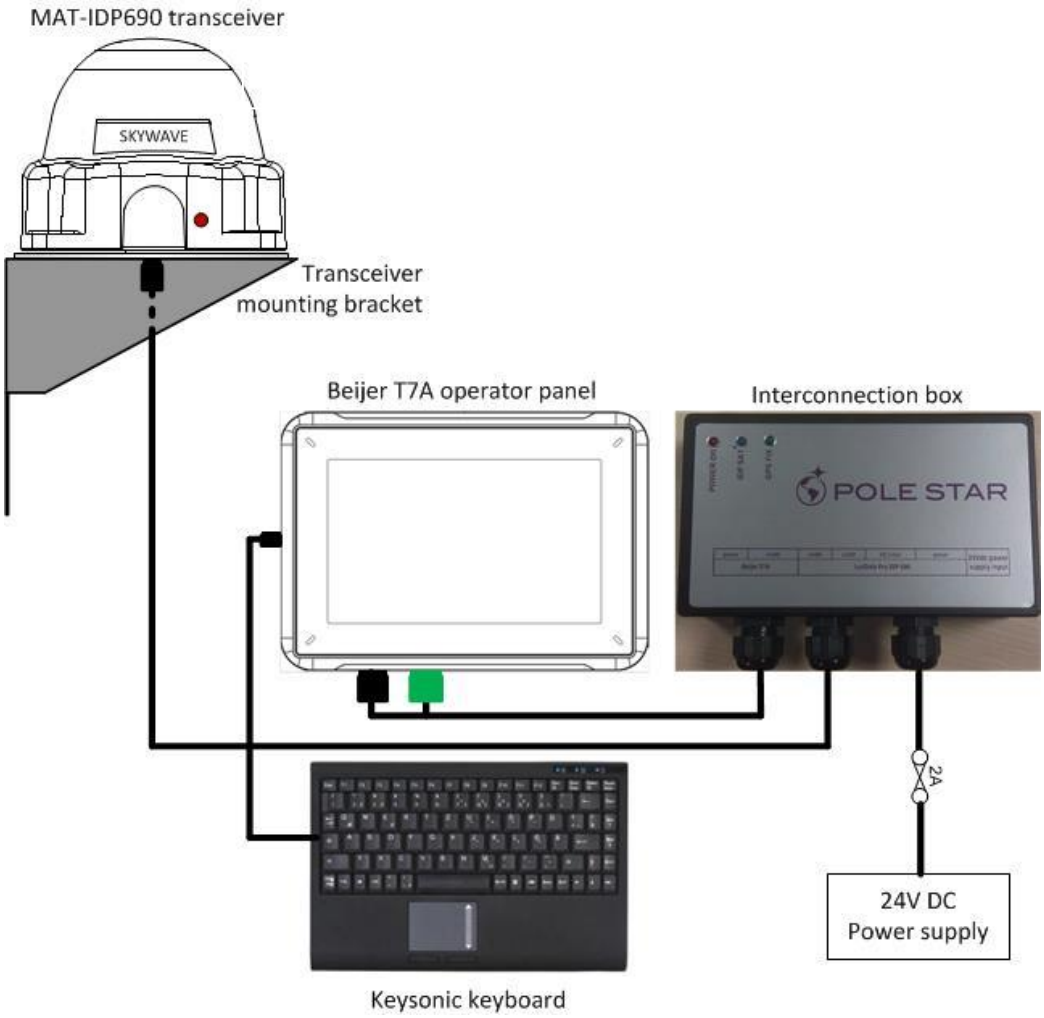

Figure 1: System overview

4. Installation Planning

1. Identify a suitable 24 V DC power source. This will be required to supply power to the interconnection box.

2. Select a suitable outdoor location for the MAT-IDP690 transceiver installation, taking into consideration the following:

   - The transceiver requires a **clear and unobstructed view of the sky** in order to communicate with the SkyWave and GPS satellite constellations.

   - To help minimise obstructions within the look angle range (see Figure 2) you can apply the following rule to ensure that the obstruction covers no more than 2 degrees arc:

     Safe distance = 29 x diameter of obstruction

     Example: For a pole of 10cm diameter, the safe distance is 29 x 0.1 = 2.9 metres.

   - The transceiver must be a minimum of **2 metres from any other communication systems** and must NOT be in the line of sight of radar scanners.

   - The dimensions of the transceiver mounting bracket are as shown in Figure 7.

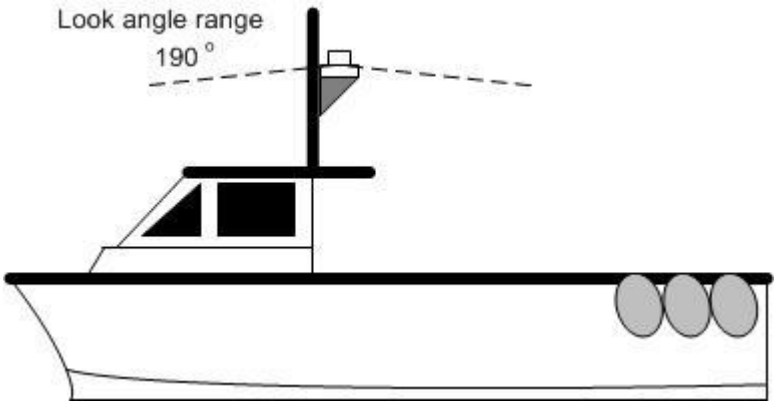

Figure 2: Transceiver mounting and look angles

3. Select a suitable mounting position for the interconnection box, noting that the transceiver cable, operator panel cable and power supply input need to be terminated at this point. See Figure 8 for MDT interconnection box dimensions.

4. Select a suitable location for the Beijer T7A operator panel, noting that it will need to be connected to the interconnection box. It is designed for panel mounting or can be installed using the mounting bracket supplied (see dimensions in Figure 10). The wheelhouse instrument panel would be a typical location for this device.

5. Installation Process

5.1 Overall Installation Process

1. Securely fasten the transceiver mounting bracket to the vessel superstructure and mount the transceiver on the mounting bracket using the 4 screws and nylock nuts provided.
2. Cover the connector pins with silicon grease, attach the connector to the base of the transceiver and seal it with self-amalgamating tape.
3. Install the interconnection box at the selected location using appropriate fixings.
4. Run the transceiver cable from the transceiver to the interconnection box and connect as shown in Figure 6.
5. Install the operator panel according to section
6.
7.

9. *5.2 Operator Panel Installation*: Panel Mounting or section *5.3 Operator Panel Installation: Standalone Mounting* as appropriate.

10. Connect the USB cable from the keyboard to the USB socket on the operator panel as shown in Figure 6.

11. Run the power and data cables from the Beijer operator panel to the interconnection box and connect to the interconnection box as shown in Figure 6. Note that the 6 unused cores should be blunt cut back to the outer sheath of the cable.

12. Run the 2-core cable from the 24V DC power source to the interconnection box and connect as shown in Figure 6. The fuse holder and 2A fuse should be connected in-line on the positive wire as shown.

13. After the transceiver is powered up, its red LED will flash while the software starts up (see Figure 4).

14. Once installed, allow approximately 10 minutes for the first position report to be transmitted.

15. Confirm that your Fleet Operations Manager (or Pole Star distributor/person responsible for the operation of the system) has received the position report.

5.2 Operator Panel Installation: Panel Mounting

1. Use the dimensions shown in Figure 9 to cut a suitable opening in the instrument panel for the operator panel.
2. Connect the 3-pin power connector and 9-pin D connector to the operator panel as shown in Figure 6
3. Secure the operator panel in position using the brackets and screws provided, as shown in Figure 3.

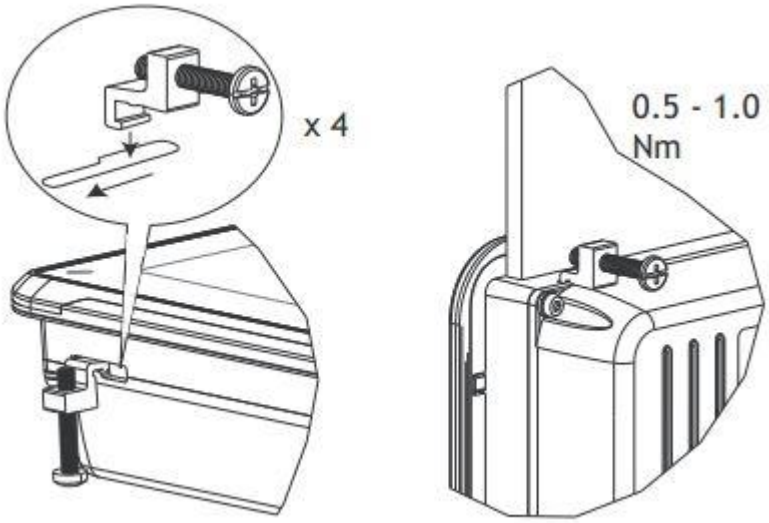

Figure 3: Mounting the operator panel

5.3 Operator Panel Installation: Standalone Mounting

1. Use the back plate of the wall mount to mark 3 x screw holes in the mounting surface.
2. Drill holes in mounting surface and attach the wall mount to mounting surface.
3. Remove the plastic cover from the back of the operator panel to expose the VESA bolt holes.
4. Attach the operator panel to the wall mount using the screws provided.

6. Operation and Maintenance

6.1 MAT-IDP690 Transceiver Operation

The transceiver operates automatically and does not require any user intervention in normal operation. When the transceiver is powered up, the red LED will flash for a short period while the software starts up (see Figure 4).

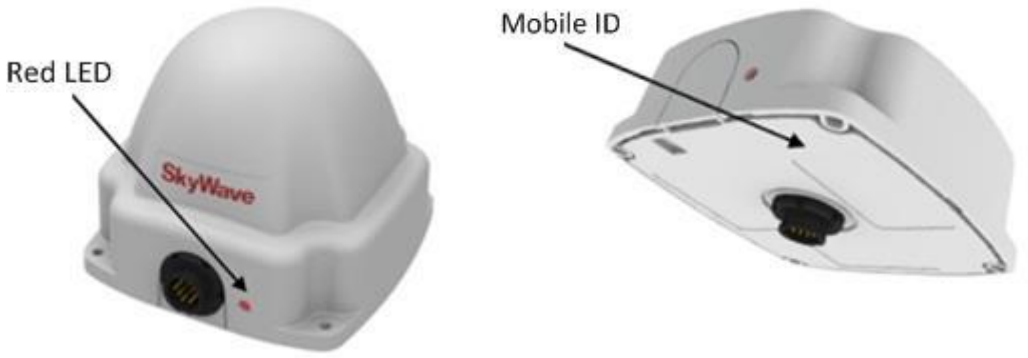

Figure 4: Transceiver LED and Mobile ID location

If you have any problems with the MAT-IDP690, please contact your Fleet Operations Manager (or Pole Star distributor/person responsible for the operation of the system) giving details of the vessel name, ship owner/company, transceiver Mobile ID (see Figure 4) and the nature of the problem.

Please note:

A correctly installed MAT-IDP690 will work reliably at sea but it is important to be aware that when the vessel is in port there is an increased probability of communication problems. In a port there is likely to be a high concentration of interference sources from both land and vessel-based communications equipment. High power VHF, UHF and microwave equipment can all cause interference problems. Buildings, gantries and other large structures can also cause problems in port by blocking the line of sight to the satellite.

The MAT-IDP690 must NOT be painted as this may inhibit transmission/reception of satellite signals.

6.2 Interconnection Box Operation

The current status of the interconnection box is indicated by the 3 LEDs as shown in Figure 5. In normal operation, the LEDs function as follows:

- The red ‘POWER ON’ LED indicates that the interconnection box is connected to a 24V DC power supply and should be lit constantly.
- The blue ’IDP SAT’ LED indicates that the interconnection box is connected to the MAT-IDP690 and should be lit constantly.
- The green ‘GPS FIX’ LED indicates that the transceiver has a valid GPS fix.

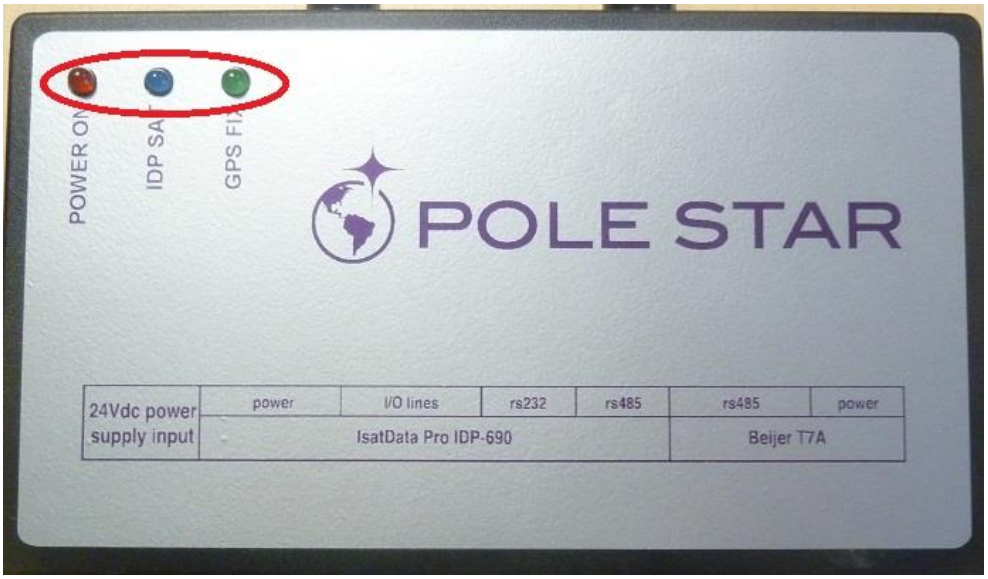

Figure 5: Interconnection box LEDs

7. Specifications

7.1 Transceiver Specifications

PHYSICAL	
Dimensions	Length: 125.8mm x Width: 125.8mm x Height: 100.8mm
Weight	460 g

ENVIRONMENTAL	
Operating temperature range	-40° to +85° C
Storage temperature range	-40° to +85° C
Humidity	90% Relative Humidity at 85° C
Vibration	SAE J1455 (Sec 4.9, 4.2) MIL-STD-810G (Sec 514.6)
Shock (survival)	MIL-STD-810G (Sec 516.6)
Transceiver environmental rating	IP67
Load dump protection	SAE J1455 (Sec 4.13)

ELECTRICAL	
Input voltage	12-24 V dc
Power consumption (typical. @ 12 V dc)	Receive with GPS: 60 mA Transmit: 0.75 A Sleep:100 uA Processing: 10 mA
Mating connector	SA901020-001

SATELLITE	
Coverage	Global
Frequency range	Rx: 1525.0 to 1559.0 MHz Tx: 1626.5 to 1660.5 MHz
Sensitivity	Acquisition: -136 dBm Tracking: -146 dBm
EIRP	7.0 dBW/5.0 dBW
Elevation angle range	-5% to +90%

GPS	
Frequency	1575.42 MHz
Channels	16 parallel

CERTIFICATIONS	
Inmarsat, FCC, CE Mark, ROHS	

7.2 Interconnection Box Specifications

PHYSICAL	
Dimensions Including Cable Glands	Length: 194mm x Width 114mm x Depth 59mm Weight (no Cable) 480g
ENVIRONMENTAL	
Operating temperature range	-20° to +40° C
Storage temperature range	-40° to +85° C
Humidity	90% Relative Humidity at 85° C
Sensor environmental rating	IP54
ELECTRICAL	
Input voltage	24 V dc
Fuses	2 x 2Amp (for transceiver and operator panel)

7.3 Beijer T7A Operator Panel Specifications

PHYSICAL	
Front panel dimensions	Width: 204mm x Height:143mm x Depth: 7mm
Mounting depth	43 mm (143 mm including clearance)
Active area of display	Width: 152.4mm x Height: 91.4mm
Weight	800g
ENVIRONMENTAL	
Operating temperature range	-10° to +60°C
Storage temperature range	-20° to +70°C
Humidity	<85 % non-condensed
Sensor environmental rating	Front panel seal: IP 65, Rear panel seal IP 20
ELECTRICAL	
Input voltage	24 V dc, max. 2A. The power supply must conform to the requirements of IEC 60950 and IEC 61558-2-4.

Appendix I: MDT Interconnection Box Wiring Diagram

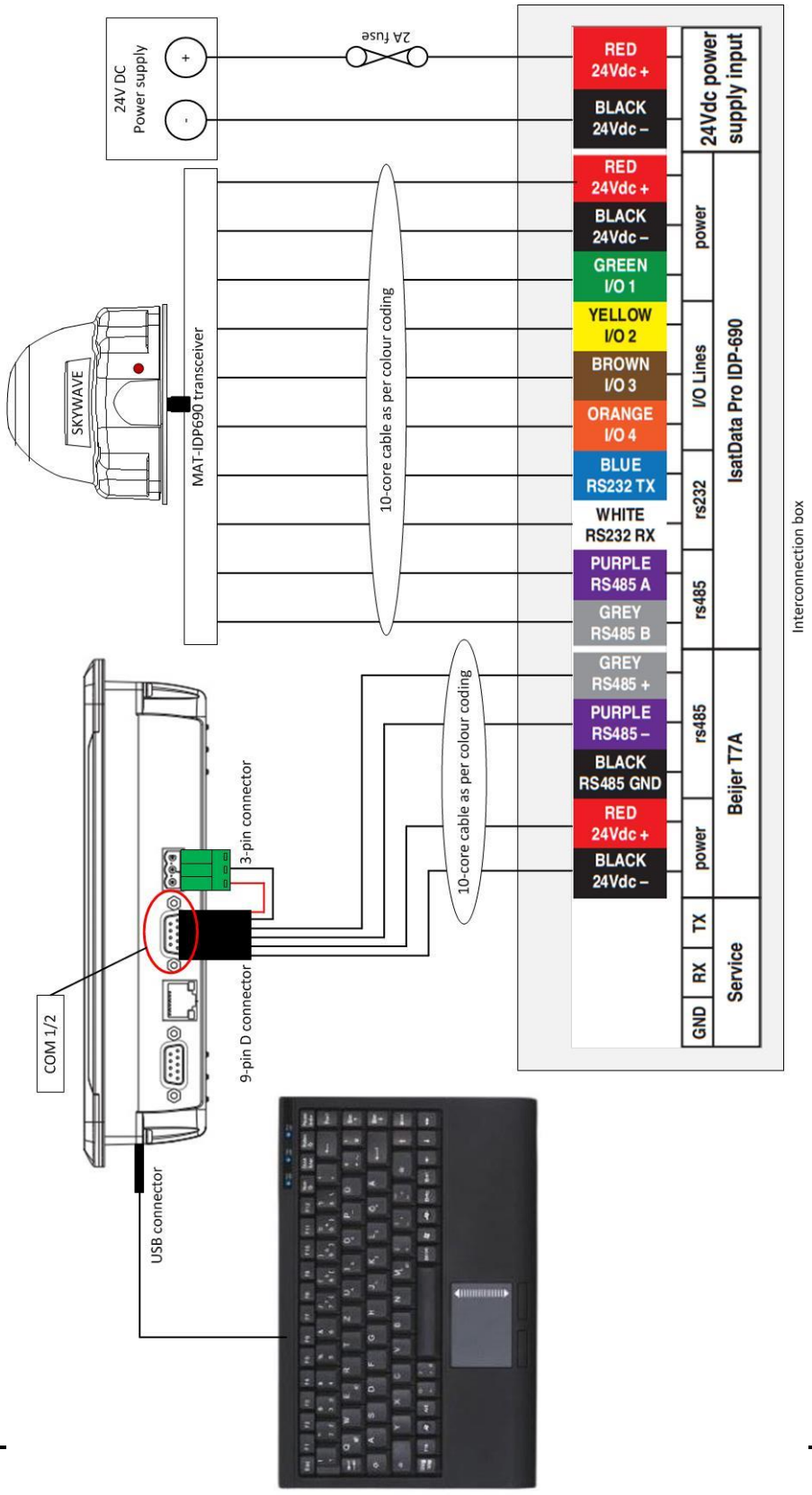
24V DC
Power supply
+
-
2A fuse
RED
24Vdc +
BLACK
24Vdc –
24Vdc power
supply input
RED
24Vdc +
BLACK
24Vdc –
GREEN
I/O 1
YELLOW
I/O 2
BROWN
I/O 3
ORANGE
I/O 4
BLUE
RS232 TX
WHITE
RS232 RX
PURPLE
RS485 A
GREY
RS485 B
power
I/O Lines
rs232
rs485
IsatData Pro IDP-690
SKYWAVE
MAT-IDP690 transceiver
10-core cable as per colour coding
GREY
RS485 +
PURPLE
RS485 –
BLACK
RS485 GND
RED
24Vdc +
BLACK
24Vdc –
rs485
power
Beijer T7A
GND
RX
TX
Service
Interconnection box
3-pin connector
9-pin D connector
COM 1/2
USB connector

Figure 6: MDT interconnection box wiring

Appendix II: Dimension Diagrams

Transceiver Mounting Bracket

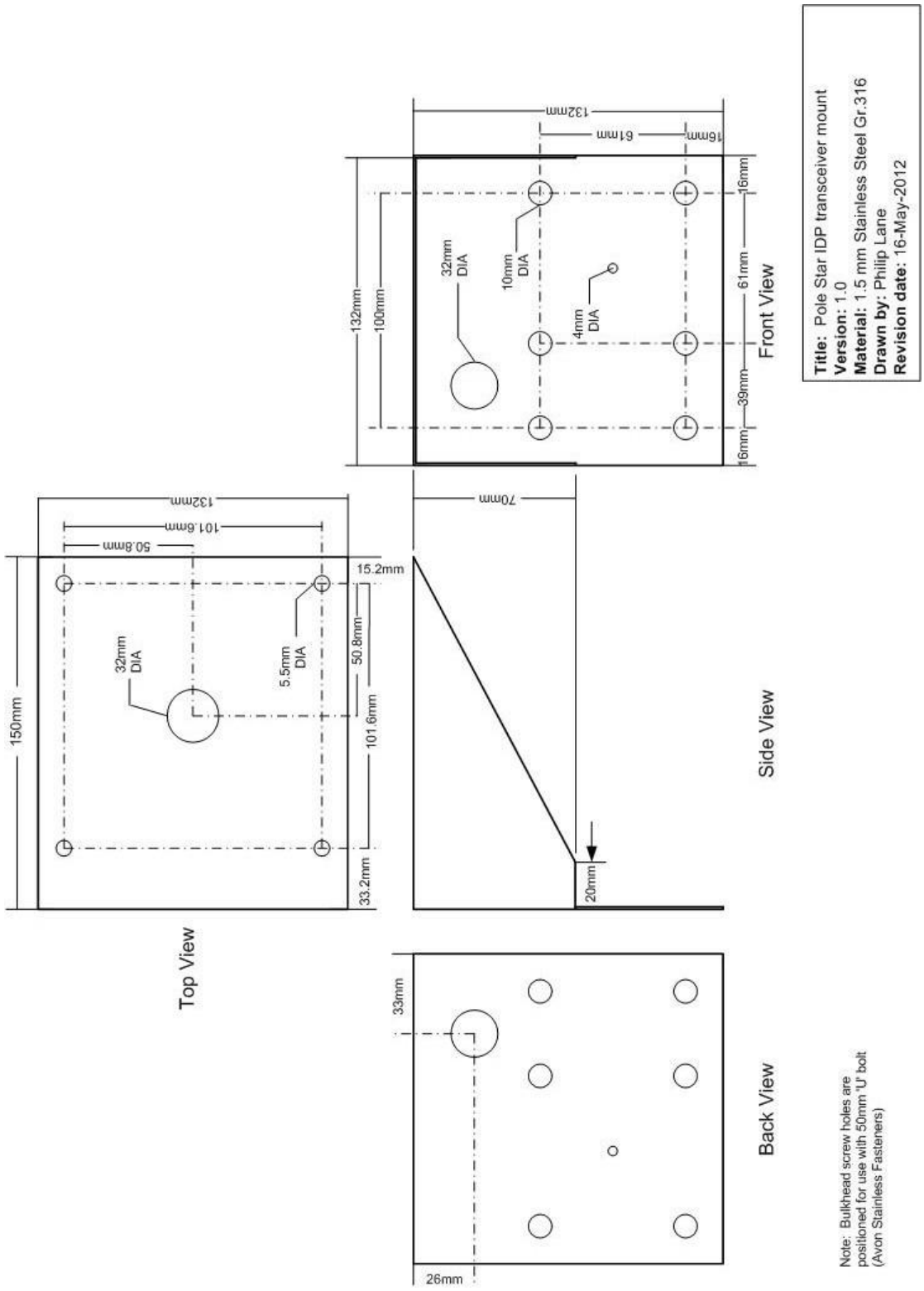

Figure 7: Transceiver mounting bracket dimensions

MDT Interconnection Box

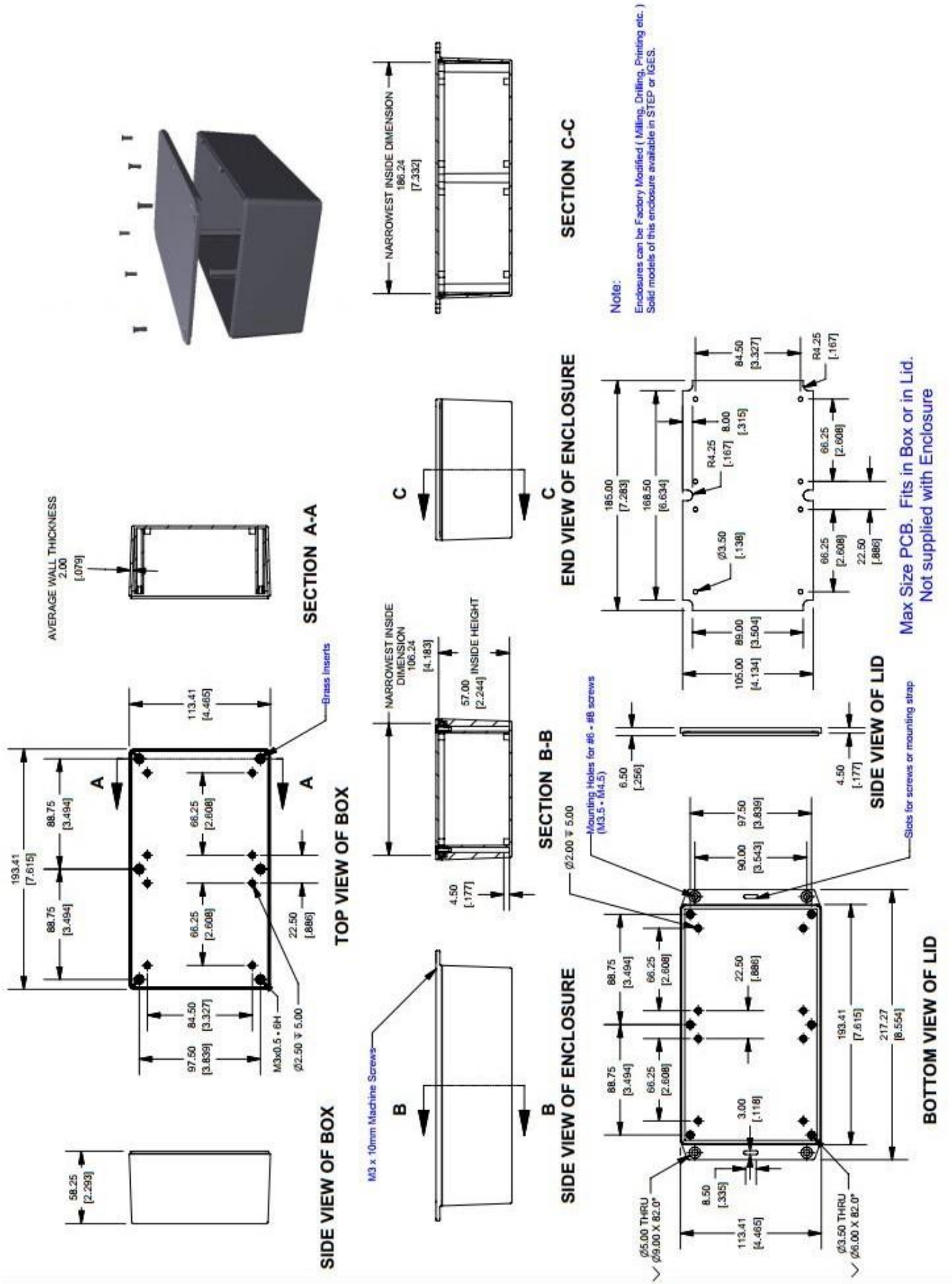

Figure 8: MDT interconnection box external dimensions

Beijer T7A Operator Panel

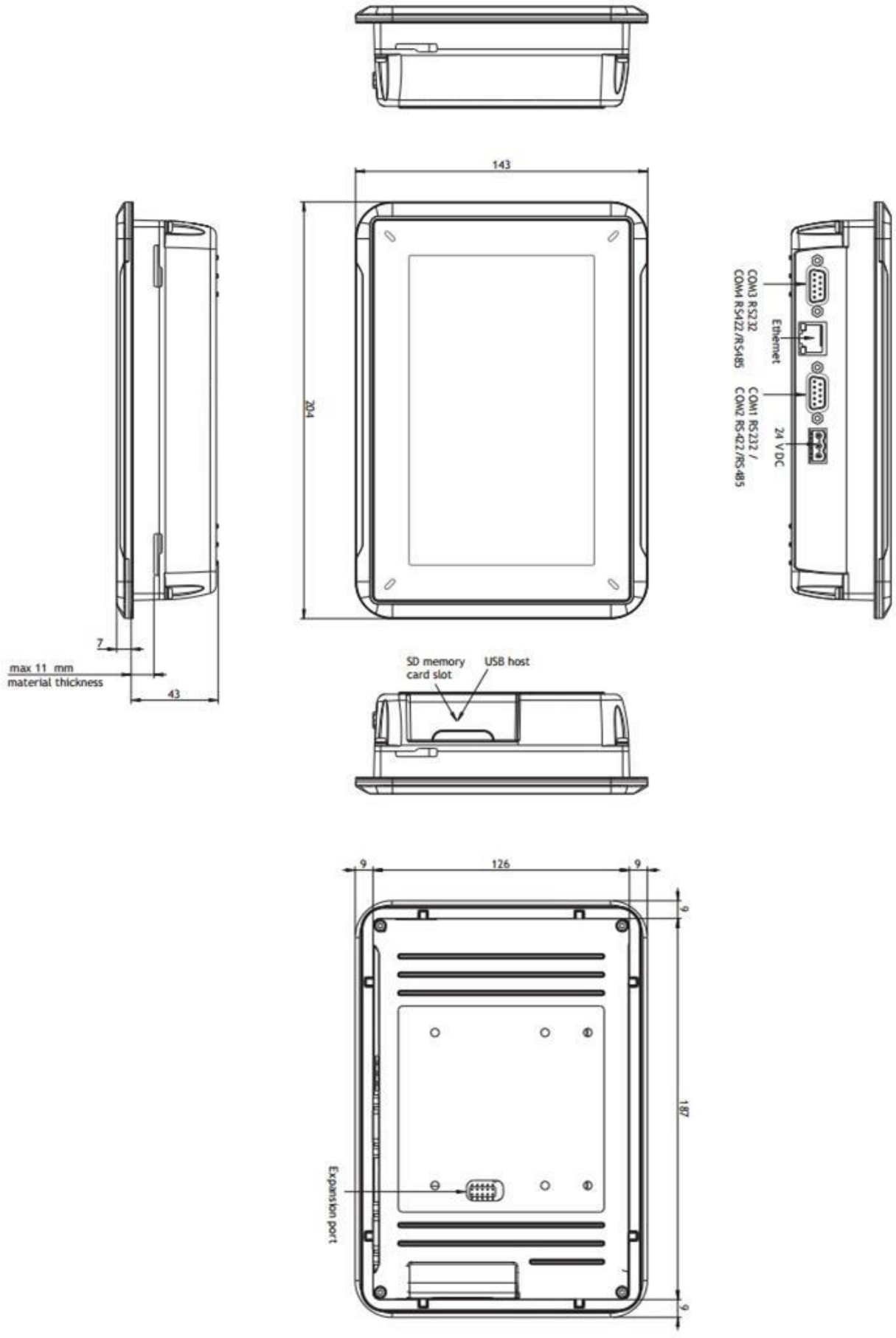

Figure 9: Beijer T7A external dimensions

Operator Panel Wall Mount

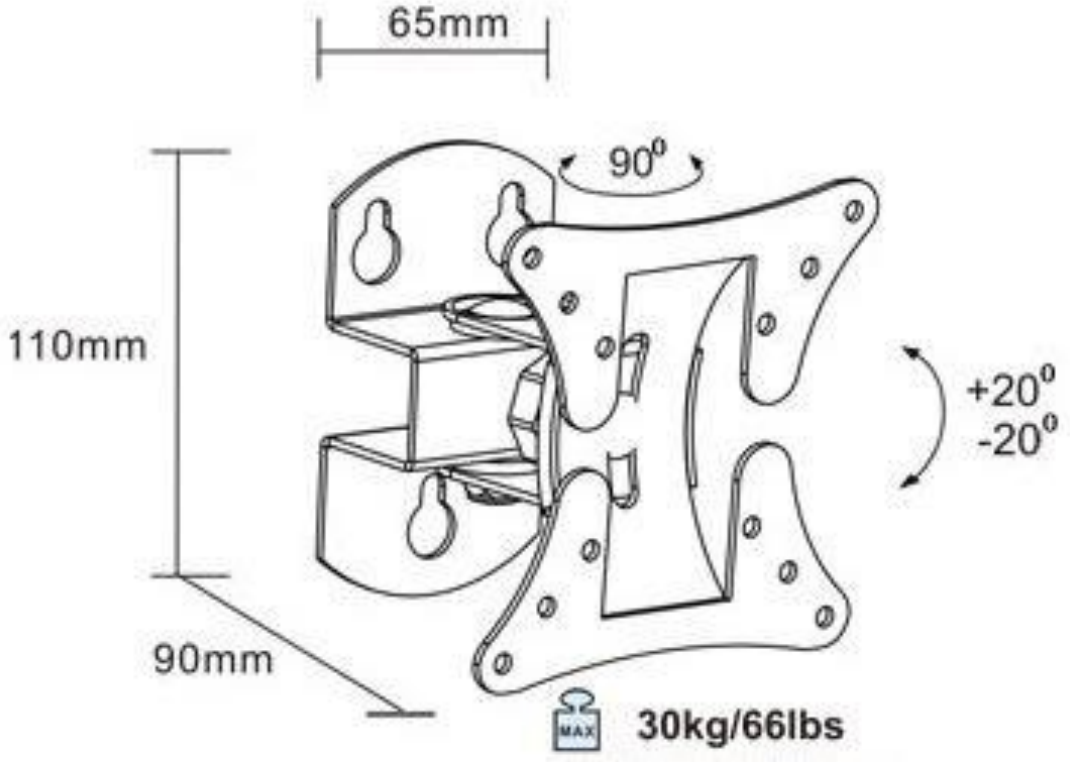

Figure 10: Wall mount dimensions