

REPEATERS

Technical description

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INTRODUCTION

This document covers devices from the Repeater's device group.

This document describes structure, operating principles and technical specifications of the Products manufactured by "NPK MSA", LLC.

UNIVERSAL DIGITAL REPEATER DR-109, DR-109W



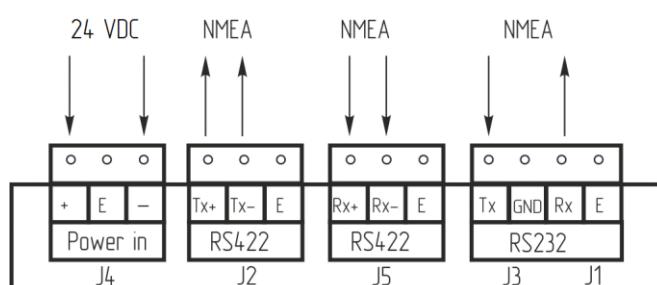
Description

The Product ensures display of digital data received in NMEA 0183 (NMEA) standard sentences through RS-232 and RS-422 serial interfaces.

Technical specifications

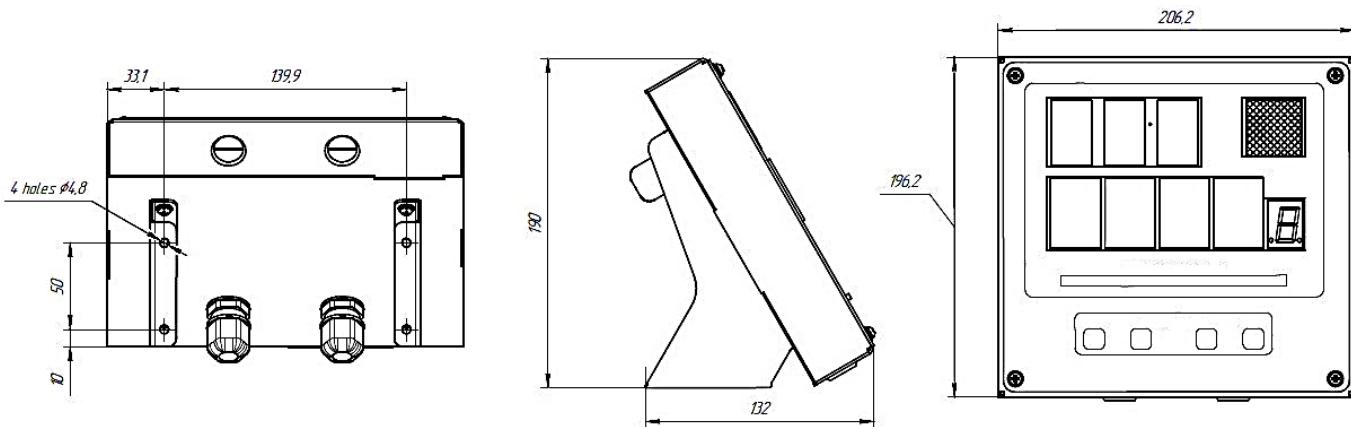
Parameter	Value				
	DR-109	DR-109W			
Input voltage, VDC	9.6 to 36.0				
Power consumption, W	5				
Galvanic isolation from the power mains	+				
Overcurrent protection	+				
Reverse polarity protection	+				
Number of ports, pc.	1 × RS-232 galvanically isolated (input and output port); 1 × RS-422 galvanically isolated (input port); 1 × RS-422 galvanically isolated (output port)				
Data baud rate (reception / transmission), kbit/s	4.8; 9.6; 19.2; 28.8; 38.4; 56; 57.6; 115.2				
Input data format	IEC61162-1.2 (NMEA 0183 version 1(2))				
Output data format	NMEA 0183 (input retransmission)				
Input NMEA sentences	DBK, DBT, DPT, HDG, HDM, HDT, MTW, MWV, ROT, RSA, VBW, VDR, VHW, VLW, VPW, VTG, VWR, WCV, ZDA, ZFO, ZTG				
Protection degree	IP22				
Operating temperature, °C	−15 to +55				
Limiting temperature, °C	−60 to +70				
Casing material	metal				
Keyboard material (keys)	membrane (bulge)				
Mounting	into console	on a bracket	wall mounting	wall mounting	table mounting
Weight, kg	0.58	1.63	1.40	2.30	2.60

Connection diagram

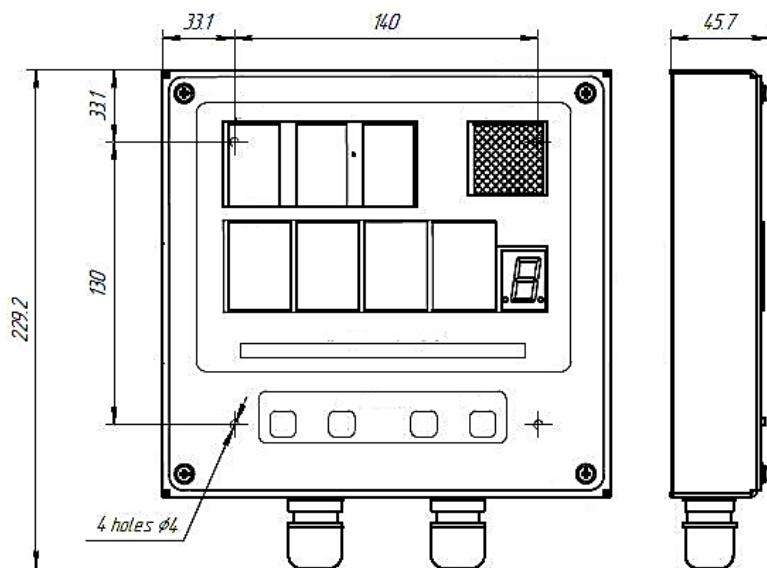


Dimensions

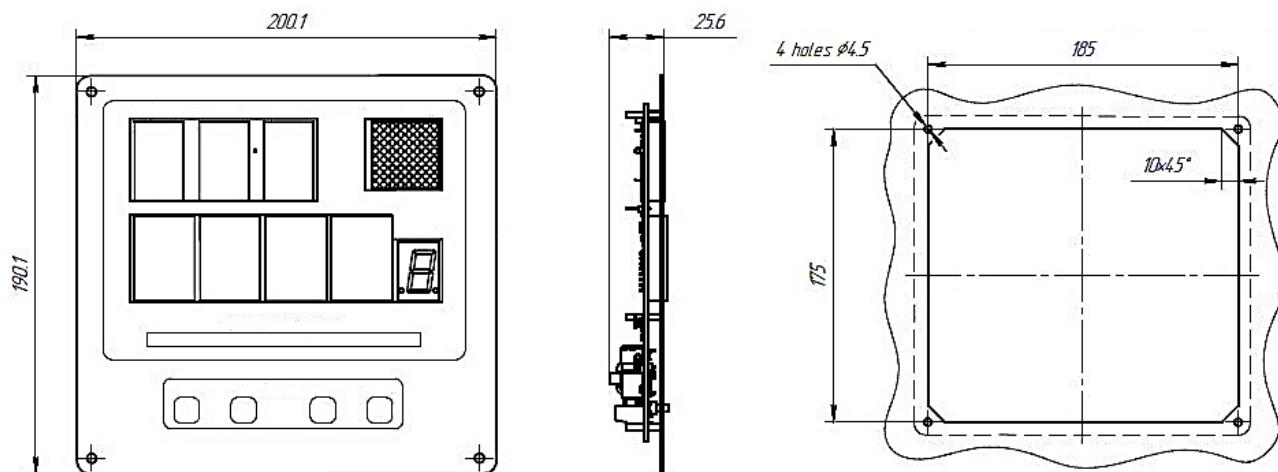
DR-109 (mounting on a bracket)



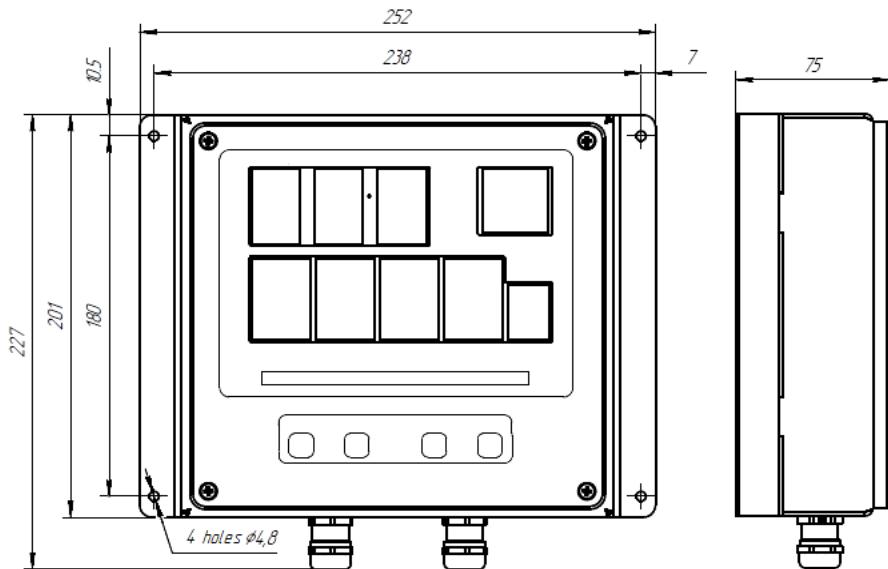
DR-109 (wall mounting)



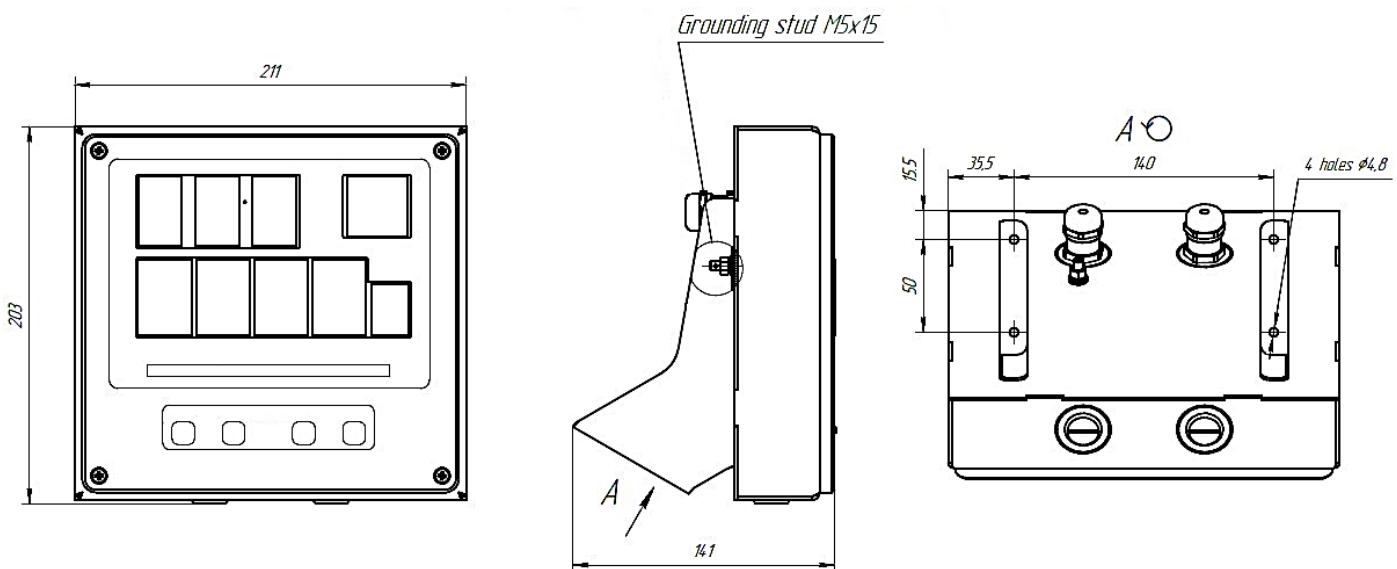
DR-109 (mounting into console)



DR-109W (wall mounting)



DR-109W (table mounting)



UNIVERSAL DIGITAL REPEATER DR-209, DR-209W



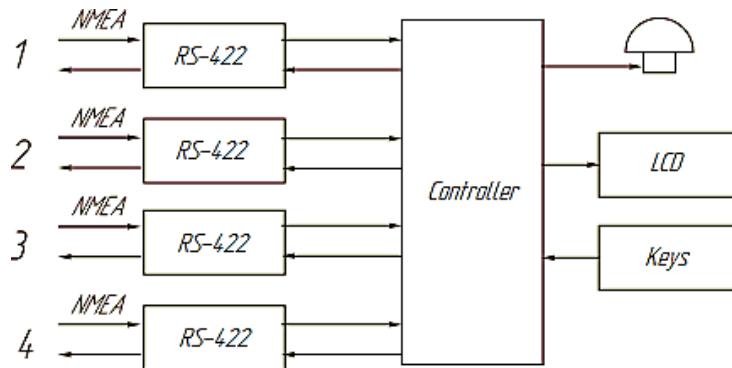
Description

The Product displays the digital data received in NMEA 0183 (NMEA) sentences format and retransmits them in the same format through the communication channels.

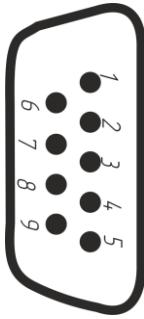
Technical specifications

Parameter	Value	
	DR-209	DR-209W
Input voltage, VDC	10 to 36	
Power consumption, W	12	
Galvanic isolation from the power mains	+	
Overshoot protection	+	
Reverse polarity protection	+	
Number of ports, pc.	4 × RS-422 asynchronous, serial, galvanically isolated (input and output port)	
Screen parameters	LCD, 240×128 pix	
Data baud rate (reception / transmission), bit/s	4800; 9600; 19200; 38400; 57600	
Input data format	IEC 61162-1.2 (NMEA 0183 ver. 1, 2)	
Input data type	NMEA 0183 (input retransmission)	
Input NMEA sentences	APB, BWC, BWR, DBK, DBS, DBT, DPT, GGA, GLC, GLL, GTD, GNS, HDT, HDG, HDM, MDA, MTW, MWV, RMB, RMC, ROT, VBW, VDR, VHW, VTG, VLW, VWR, VWT, XTE, ZDA, XDR	
Protection degree	IP22	IP56
Operating temperature, °C	-15 to +55	-40 to +55
Limiting temperature, °C		-60 to +70
Casing material	metal	
Keyboard material (keys)	membrane (bulge)	
Mounting	into console	on a bracket
Weight, kg	1.45	1.70
		wall mounting
		5.00

Connection diagram

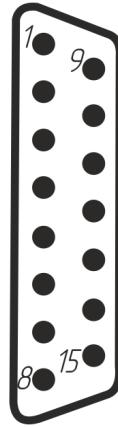


Description of DB-9F connector pins



Pin №	Description
1	Tx-
2	NC
3	Rx+
4	GND
5	GND
6	Tx+
7	Rx-
8	GND
9	GND

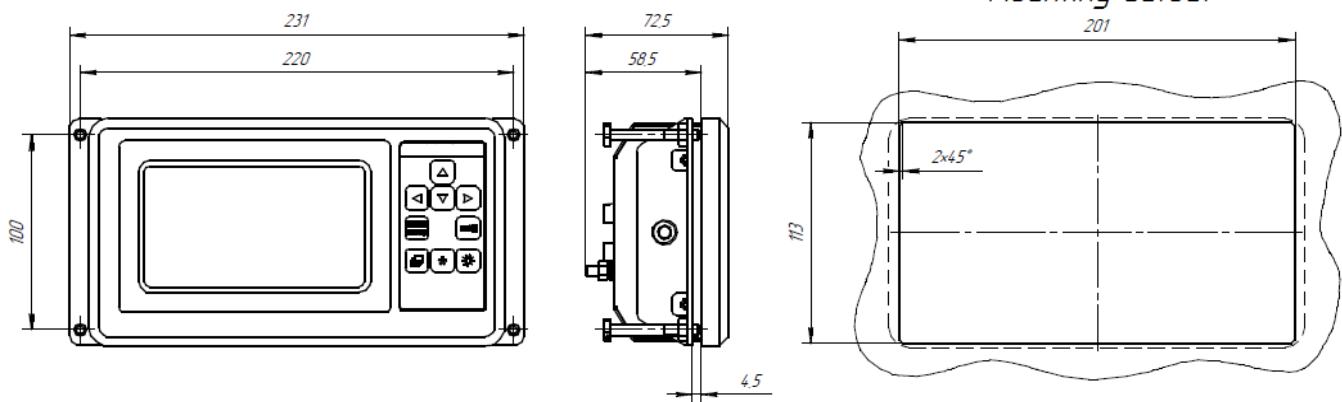
Description of DB-15F connector pins



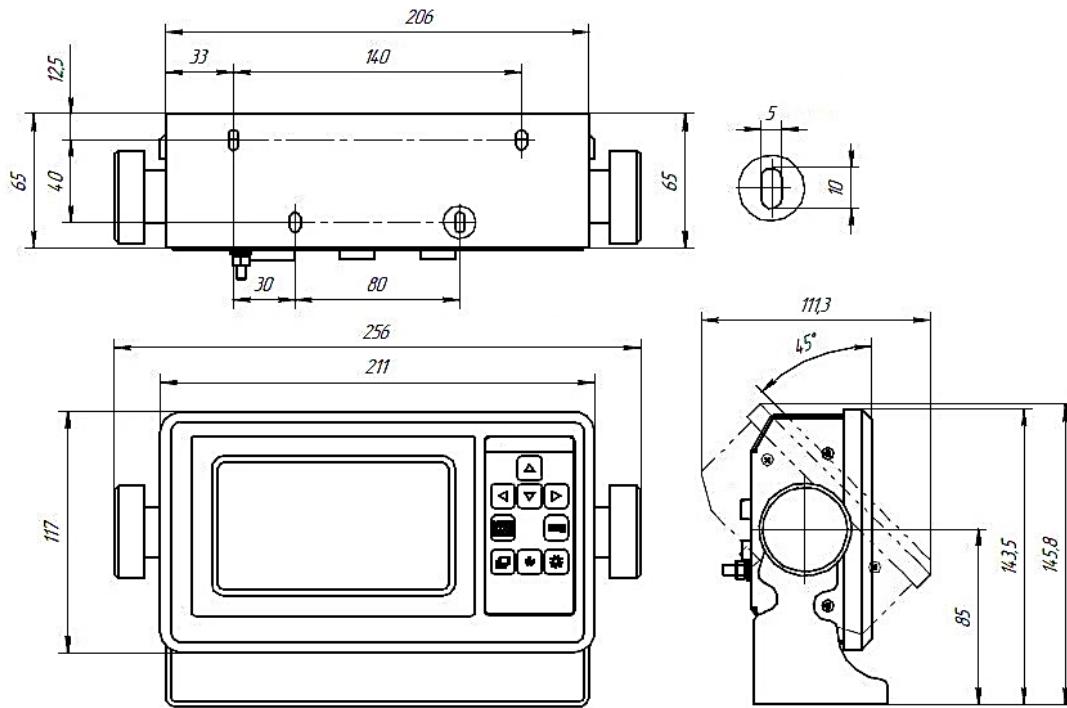
Pin №	Description
1	+24 V
2	+24 V
3	+24 V
4	+24 V
5	-24 V
6	-24 V
7	-24 V
8	-24 V
9	+24 V
10	+24 V
11	+24 V
12	+24 V
13	-24 V
14	-24 V
15	-24 V

Dimensions

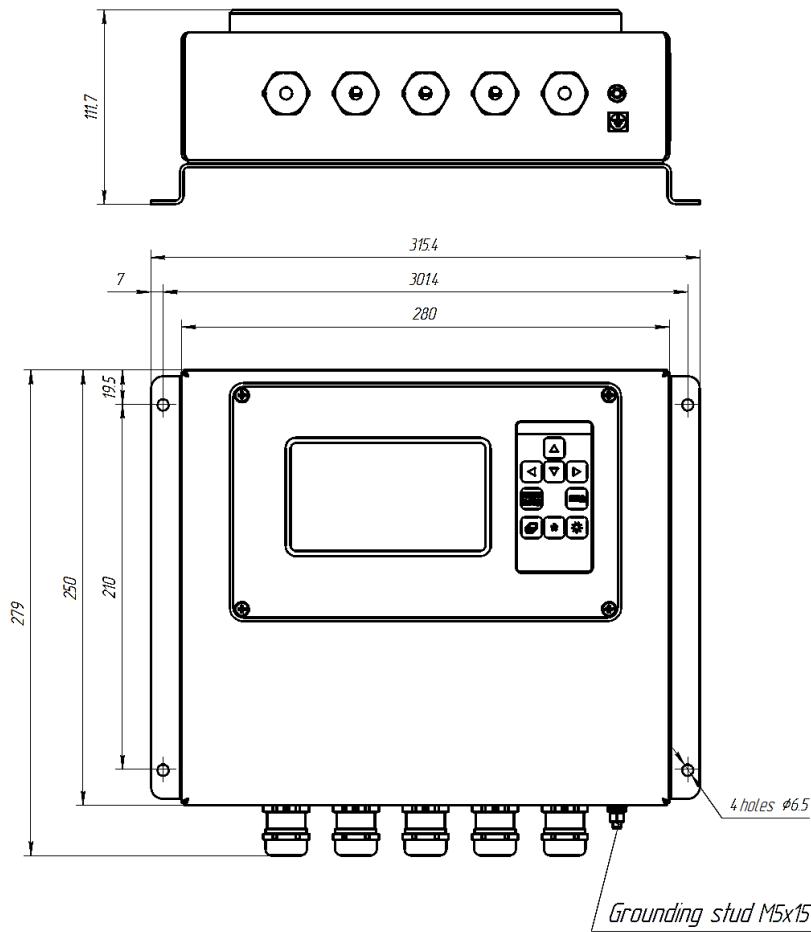
DR-209 (mounting into console)



DR-209 (mounting on a bracket)



DR-209W



UNIVERSAL DIGITAL REPEATER DR-209-3



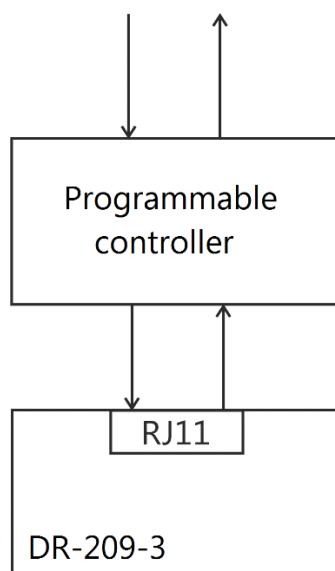
Description

The Product is designed to display data received via pLAN communication line from programmable controller in user-friendly format (graphic and (or) text).

Technical specifications

Parameter	Value	
Input voltage, VDC	18 to 30	
Power consumption, W	1.2	
Display type	FSTN	
Screen parameters	LCD, 132 × 64 pix	
Number of ports, pc.	1 × RJ11	
Interface type	pLAN	
Data baud rate (reception / transmission), bit/s	38400	
Active area, mm	66 × 32	
Protection degree	IP22	
Operating temperature, °C	−15 to +55	
Limiting temperature, °C	−60 to +70	
Casing material	metal	
Keyboard material (keys)	silicone	
Mounting	wall mounting	into console
Weight, kg	0.45	0.45

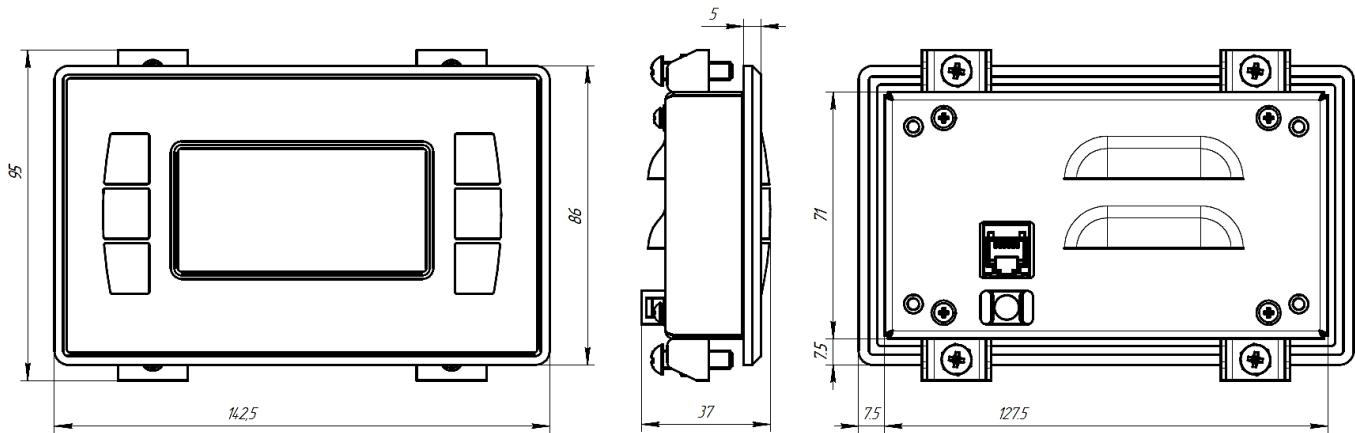
Connection diagram



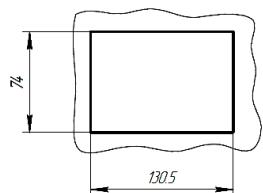


Dimensions

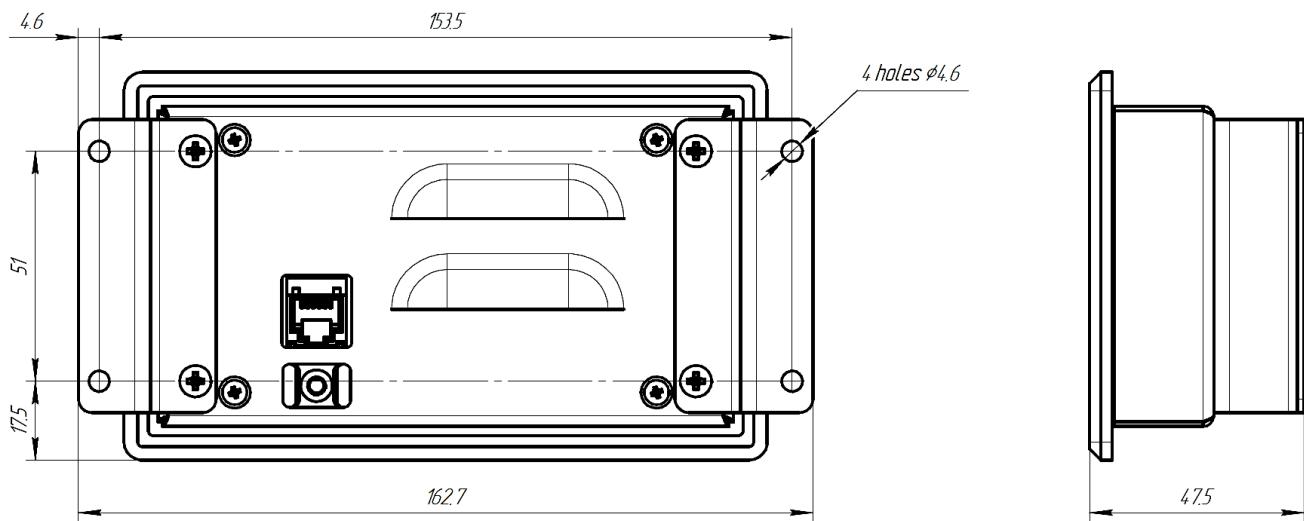
Mounting into console



Mounting cutout



Wall mounting



UNIVERSAL DIGITAL REPEATER DR-209M



Description

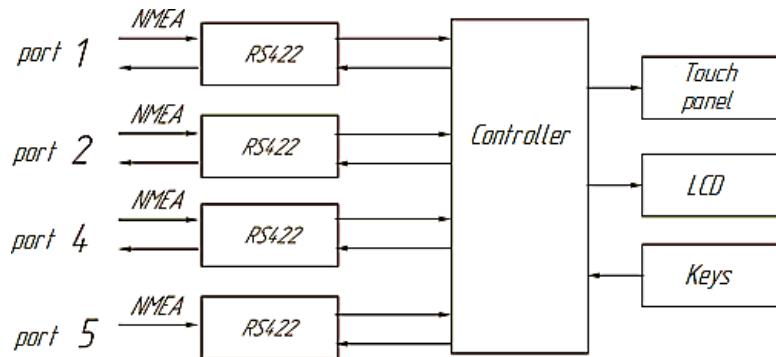
The Product provides visual display of data (in easy-to-read format: graphic, digital or graph), obtained by communication lines RS-422 (NMEA sentences format) from various ship systems and transmits obtained data to NMEA network.

Technical specifications

Parameter	Value	
Input voltage, VDC	10 to 36	
Power consumption, W	20	
Galvanic isolation from the power mains	+	
Overcurrent protection	+	
Reverse polarity protection	+	
Screen parameters	LCD, 8", 1024x768 pix, XGA, 4:3	
Touch panel parameters	resistive, 162x121	
Processor	ARM Cortex-A8 (AM3359)	
Flash card (portable), GB	8	
RAM, MB	512	
Number of ports, pc.	3 × RS-422 galvanically isolated (input and output port); 1 × to supply power to 12 V / 24 V to external load (sensors), power up to 25 W; 1 × USB port; 1 × Ethernet 100	
Data baud rate (reception / transmission), bit/s	4800; 9600; 19200; 38400; 57600; 76800; 115200	
Input data format	IEC 61162-1.2 (NMEA 0183 ver. 1, 2) and other data types at serial data transmission	
Input data type	GNSS data – coordinates, time, date and other; atmosphere parameters – temperature, humidity, etc.; wind data; heading, bearing – true, magnetic; depth; speed; other data	
Mounting	into console	on a bracket
Weight, kg	1.6	1.9
Protection degree	IP22	
Operating temperature, °C	−15 to +55	
Limiting temperature, °C	−60 to +70	
Casing material	metal	
Keyboard material (keys)	membrane (bulge)	

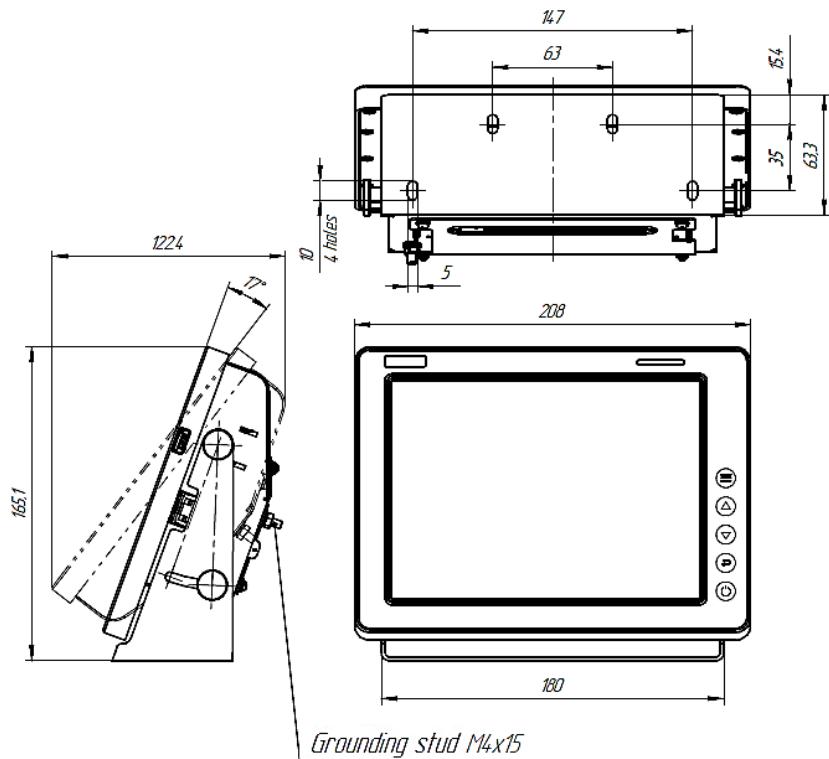


Connection diagram

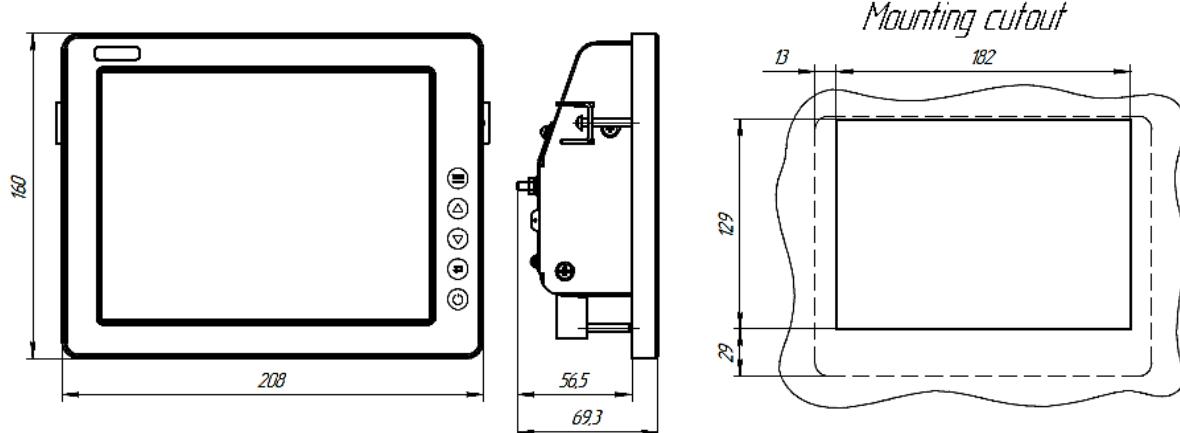


Dimensions

Mounting on a bracket



Mounting into console



NMEA sentences

Type	Characteristic	Units	Correction
APB	Cross track error	m, km, fathom, ft, mile, mile (st), inch	+
	Bearing origin to destination, true	dg	-
	Bearing origin to destination, magnetic	dg	-
	Destination waypoint id	m	-
	Bearing, present position to destination, true	dg	-
	Bearing, present position to destination, magnetic	dg	-
	Heading to steer to destination waypoint, true	dg	-
	Heading to steer to destination waypoint, magnetic	dg	-
BRG	Brightness	-	-
BWC	Time UTC	-	-
	Destination latitude	-	-
	Destination longitude	-	-
	Bearing, present position to destination, true	dg	-
	Bearing, present position to destination, magnetic	dg	-
	Range to destination	m, km, fathom, ft, mile, mile (st), inch	-
	Destination waypoint id	m	-
BWR	Time UTC	-	-
	Destination latitude	-	-
	Destination longitude	-	-
	Bearing, present position to destination, true	dg	-
	Bearing, present position to destination, magnetic	dg	-
	Range to destination	m, km, fathom, ft, mile, mile (st), inch	-
	Destination waypoint id	m	-
DBK	Depth from keel	m, km, fathom, ft, mile, mile (st), inch	+
DBS	Depth from surface	m, fathom, ft, mile, mile (st), inch	+
DBT	Depth sensor	m, km, fathom, ft, mile, mile (st), inch	+
DPT	Depth sensor	m, km, fathom, ft, mile, mile (st), inch	+
	Depth from surface	m, km, fathom, ft, mile, mile (st), inch	+
	Depth from keel	m, km, fathom, ft, mile, mile (st), inch	+
GGA	Latitude	-	-
	Longitude	-	-
	Time UTC	-	+
	Number of satellites	-	-
GLL	Latitude	-	-
	Longitude	-	-

Type	Characteristic	Units	Correction
	Time UTC	—	+
HDG	Heading magnetic	dg	+
	Heading true	dg	+
HDM	Heading magnetic	dg	—
HDT	Heading true	dg	+
HRM	Heel angle	Digital, graph	—
	Roll period	Digital	—
	Amplitude PORT	Digital, graph	—
	Amplitude STBD	Digital, graph	—
MDA	Atmospheric pressure	kPa, Pa, hPa, mmHg, inHg	—
	Air temperature	°C	—
	Water temperature	°C	—
	Humidity relative	%	—
	Humidity absolute	%	—
	Wind direction true	dg	+
	Wind direction magnetic	dg	+
	Wind speed	nautical miles/h, m/s, km/h, mph	—
MTW	Water temperature	°C	—
MWD	Wind direction true	dg	+
	Wind direction magnetic	dg	+
	Wind speed	nautical miles/h, m/s, km/h, mph	—
	Wind direction relative	dg	+
MWV	Wind direction true	dg	+
	Wind speed relative	nautical miles/h, m/s, km/h, mph	—
	Wind speed	nautical miles/h, m/s, km/h, mph	—
	Latitude	—	—
RMA	Longitude	—	—
	Ground speed	nautical miles/h, m/s, km/h, mph, mph (st)	—
	Track made good true	dg	—
	Track made good magnetic	dg	—
	Cross track error	m, km, fathom, ft, mile, mile (st), inch	—
RMB	Origin waypoint id	m	—
	Destination waypoint id	m	—
	Destination latitude	—	—
	Destination Longitude	—	—
	Range to destination	m, km, fathom, ft, mile, mile (st), inch	—
	Bearing, present position to destination, true	dg	—
	Destination closing velocity	nautical miles/h, m/s, km/h, mph, mph (st)	—
	Latitude	—	—
	Longitude	—	—
RMC	Ground speed	nautical miles/h, m/s, km/h, mph, mph (st)	—
	Heading true	dg	—
	Heading magnetic	dg	—
	Time UTC	—	—
	Date UTC	—	—
ROT	Rate of turn	dg/min, dg/s	—
VBW	True water speed	nautical miles/h, m/s, km/h, mph, mph (st)	—

Type	Characteristic	Units	Correction
VDR	Ground speed	nautical miles per hour, m/s, km/h, mph, mph (st)	-
	Drift direction true	dg	-
	Drift direction magnetic	dg	-
	Drift speed	nautical miles per hour, m/s, km/h, mph, mph (st)	-
VHW	Heading true	dg	+
	Heading magnetic	dg	+
	True water speed	nautical miles per hour, m/s, km/h, mph	-
VLW	Total distance travelled in the water	nautical miles, km, fathom, ft, mile, inch	-
	Distance travelled in the water	nautical miles, km, fathom, ft, mile, inch	-
VTG	Track made good true	dg	-
	Track made good magnetic	dg	-
	Ground speed	nautical miles per hour, m/s, km/h, mph, mph (st)	-
VWR	Wind direction relative	dg	+
	Wind direction relative	nautical miles per hour, m/s, km/h, mph	-
VWT	Wind direction true	dg	+
	Wind speed	nautical miles per hour, m/s, km/h, mph	-
XTE	Cross track error	nautical miles, km, fathom, ft, mile, inch	+
ZDA	Time UTC	-	+
	Date UTC	-	-
	Correction for time zone	-	-
ZTG	Time UTC	-	+
	Time remaining	-	-
	Destination waypoint id	m	-
GRP102	Heel angle	-	-
	Pitch angle	-	+
	Heave	-	+
	Down velocity	-	-
	Down acceleration	-	-
GRP103	Heel angle	-	-
	Pitch angle	-	+
	Heave	-	+
	Down velocity	-	-
	Down acceleration	-	-
Notes			
1 «+» – value correction is available.			
2 «-» – value correction is not available.			

COURSE REPEATER DR-309



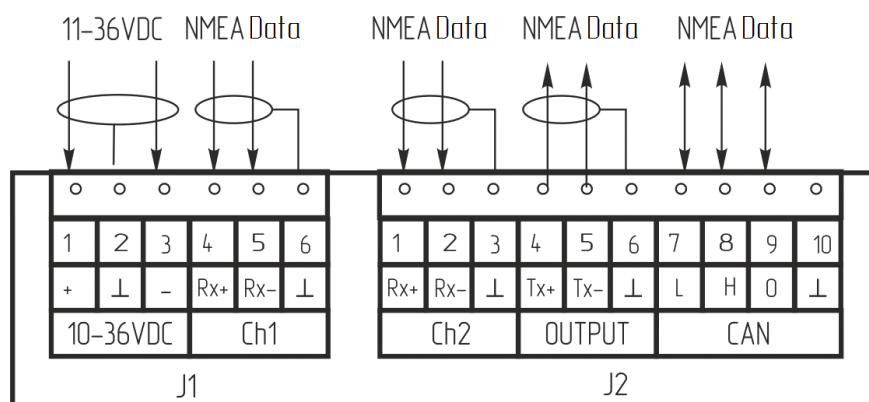
Description

The Product displays the vessel's course data received in NMEA 0183 standard sentences from various digital sources using a card and LED indicator. The Product rebroadcasts input NMEA data through an RS-422 interface.

Technical specifications

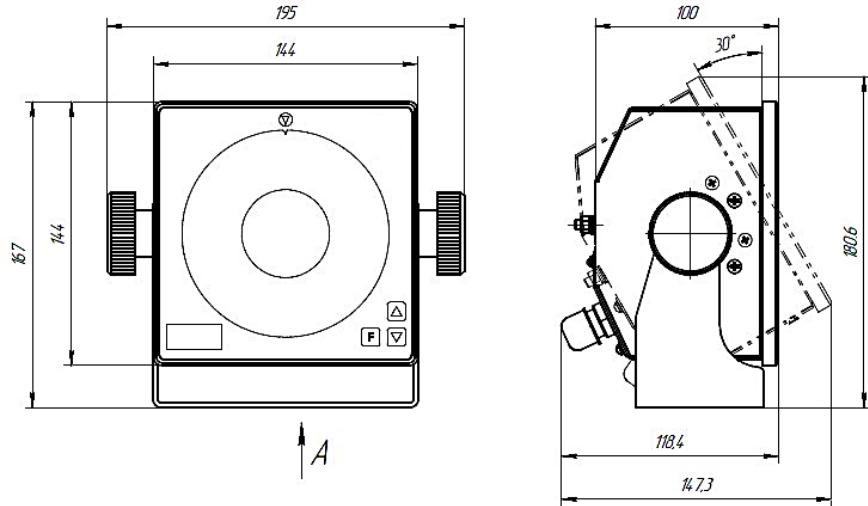
Parameter	Value							
Input voltage, VDC	11 to 36							
Power consumption, W	12.5							
Galvanic isolation from the power mains	+							
Short circuit protection	+							
Reverse polarity protection	+							
Indicator	card							
Input (output) ports, pc.	3 x RS-422/232 (asynchronous, serial, opto-isolated)							
Data baud rate (reception / transmission), kbit/s	2.4; 4.8; 9.6; 11.4; 19.2; 28.8; 38.4; 57.6; 76.8; 115.2							
Input data format	IEC61162-1.2 (NMEA 0183 version 1(2))							
Output data format	NMEA 0183 (input retransmission)							
Input NMEA sentences	HDT, HDG, HDM							
Protection degree	IP22		IP44					
Operating temperature, °C	−15 to +55							
Limiting temperature, °C	−60 to +70							
Casing material	metal							
Keyboard material (keys)	membrane (bulge)							
Mounting	into console	on bracket (tabletop)	into console	on bracket (tabletop)	on bracket (wall mounted)			
Weight, kg	2.0	2.2	2.0	2.2	2.3			

Connection diagram

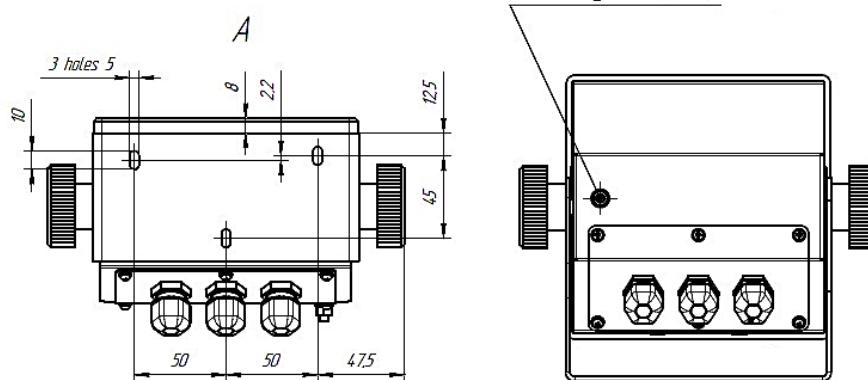


Dimensions

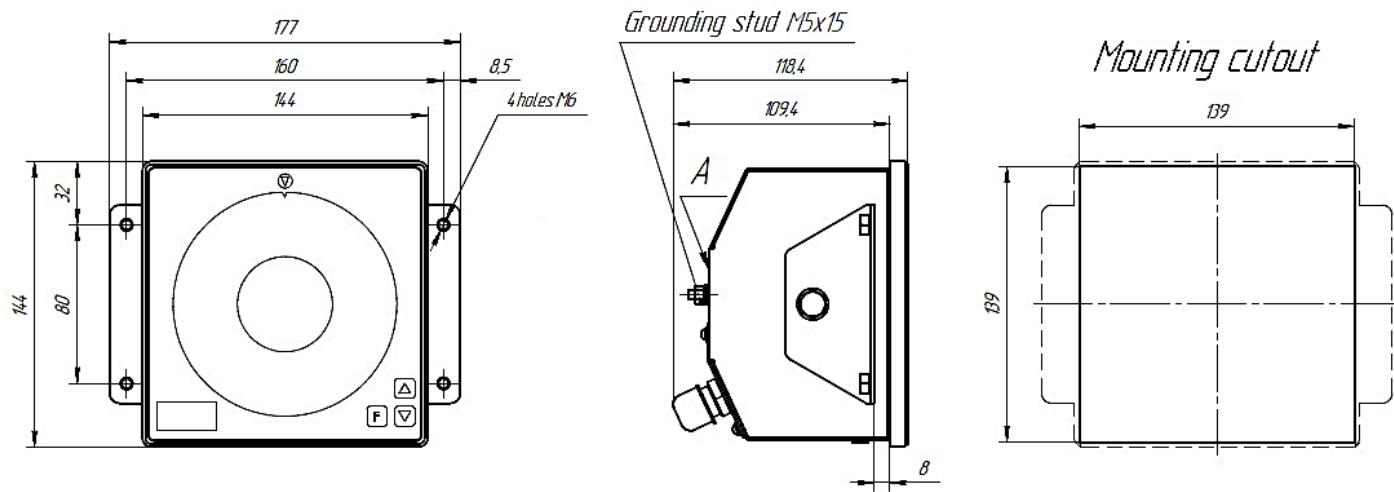
Mounting on a bracket (tabletop)



Grounding stud M5x15

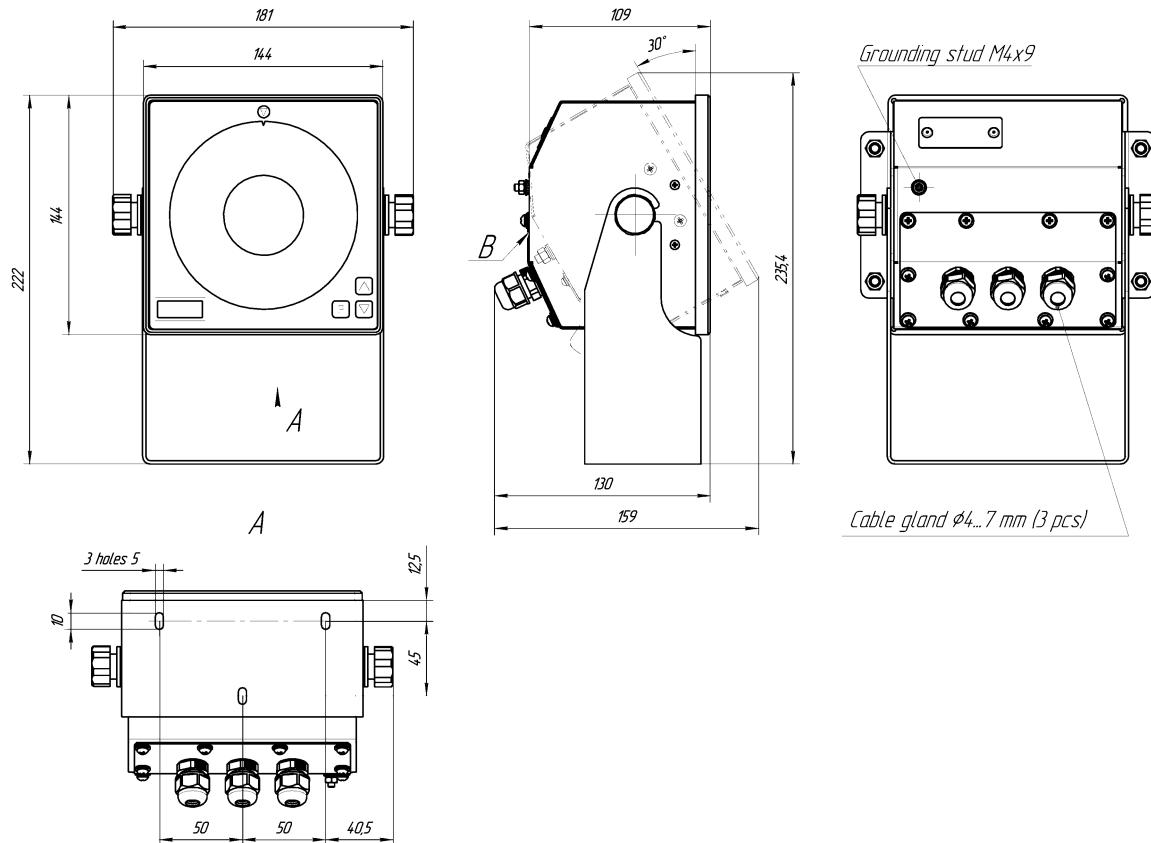


Mounting into console





Mounting on a bracket (wall mounted)



FOR NOTES