NEYRPIC® ACU350/550 ADAPTOR
Installation Manual

Contents

Chapter 1 Cautions

Electrical currents and voltages in this equipment are dangerous. Personnel must observe safety regulations at all times.

Any work inside the equipment must be done with the power switched off.

Chapter 2   Introduction

2.1   Abbreviations

Abbreviations	Comments
ACU	Antenna Control Unit
PDU	Power Drive Unit Power interface between the ACU and motors. Also contains automation systems and management of safety devices.
RCB	Remote Control Box
AZ	Azimuth axis
EL	Elevation axis
POLAR	Polarisation axis

2.2 References

Related documentations:

Réf	Name	Num.	Comments
R1	NEYRPIC® ACU550 operation Manual	ATM13OPM05A55001	
R2	NEYRPIC® ACU550 Ethernet Interface	ATM13IFM01A55001	
R3	NEYRPIC® ACU550 Monitor and Control Interface	ANT13IFM01A55002	
R4	NEYRPIC® ACU550 Installation manual	ATM13INM04A55001	

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Chapter 3   Overview

3.1   Introduction

As more than 400 tracking systems have been installed worldwide with the NEYRPIC® ACU 350, NPC SYSTEM developed an adaptor rack allowing customers to install the latest generation controller (ACU 550) in lieu of their older controller (ACU 350). The NEYRPIC® ACU 350/550 ADAPTOR RACK allows an easy replacement as the back panel is identical to the ACU 350, minimizing the cable connection task. A focus has been put on the compatibility of the monitoring and control system. For upgrades, no modification of the supervision software is needed to accommodate for the ACU 550.

Figure 1: ACU350/550 Adaptor with ACU550

3.2   Product overview

An ACU350/550 Adaptor consists of an NEYRPIC® ACU550 with a mechanical and electrical interface, called the NEYRPIC® ACU350/550 Adaptor.

The ACU 550 is fully integrated in the Adaptor and can be removed from it even if the adaptor is already installed in a NEYRPIC® 4100 system.
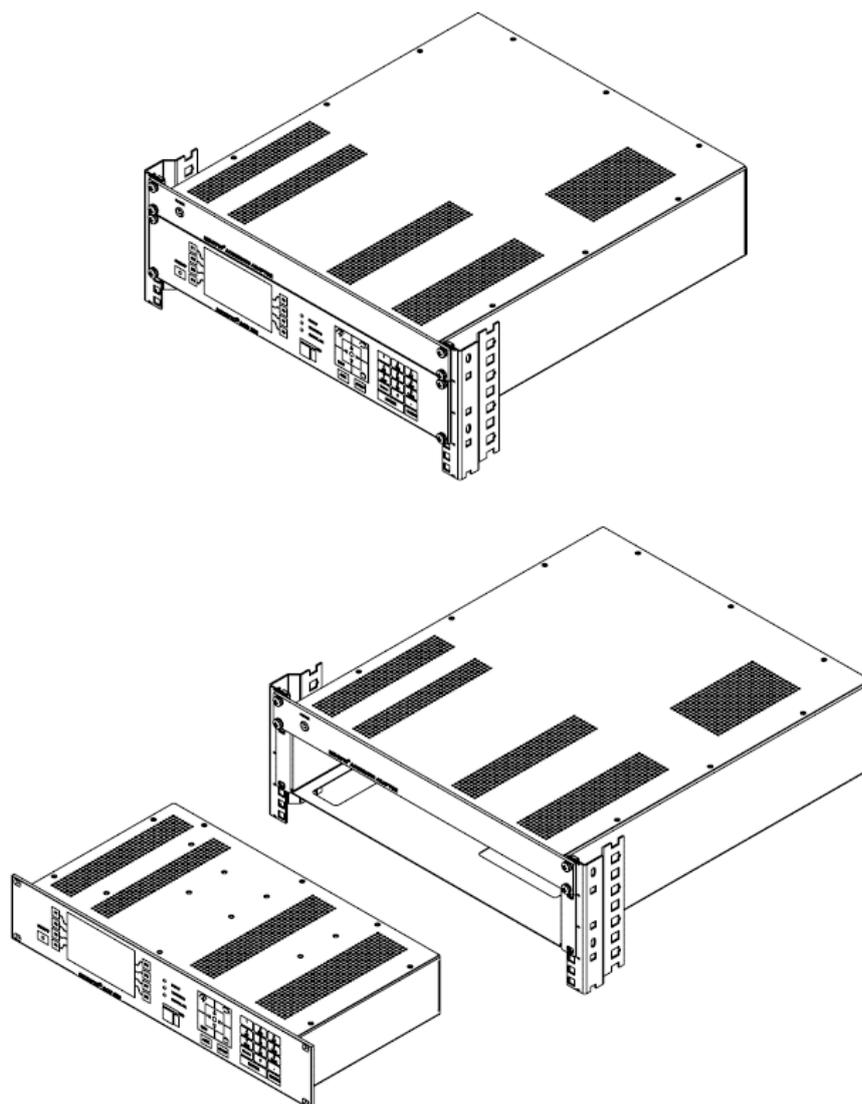
3.3   Product versions

3.3.1   Two different versions

The Adaptor is offered in two versions:

- Standard version
- Full version

The adaptor in its full version can be installed in any system without restriction.

The adaptor in its standard version cannot be installed in system using the following functionalities:

- Monopulse
- Autophasing
- Customer Digital I/O (RF switches control)
- Survival locks management
- Survival indication output
- Lubrication

In comparison with the ACU350, the two Adaptor versions don't implement the following functionalities:

- SERIAL3 and SERIAL4 management
- Temperature output contact

3.3.2   ACU 550 licences restrictions

The ACU550 inside the adaptor can have any licence (STD, MNP or LEO, see doc. R1 for more details).

Even with an ACU 550 with MNP or LEO licence, the system functionalities could be restricted as explain in section 3.3.1 due to the version of the adaptor

3.4   Product characteristics

3.4.1   Electrical characteristics

Power supply	:	100 to 240 VAC
Power supply frequency	:	47 to 63 Hz
Maximum consumption	:	175 W at 240 VAC
Operation temperature	:	-40°C to +70°C
Storage temperature	:	-40°C to +70°C
Humidity	:	<50% at 40°C and <90% at 20°C

3.4.2   Product size

The ACU350/550 Adaptor is 19 inches wide, 3U high and weights 15 Kg.
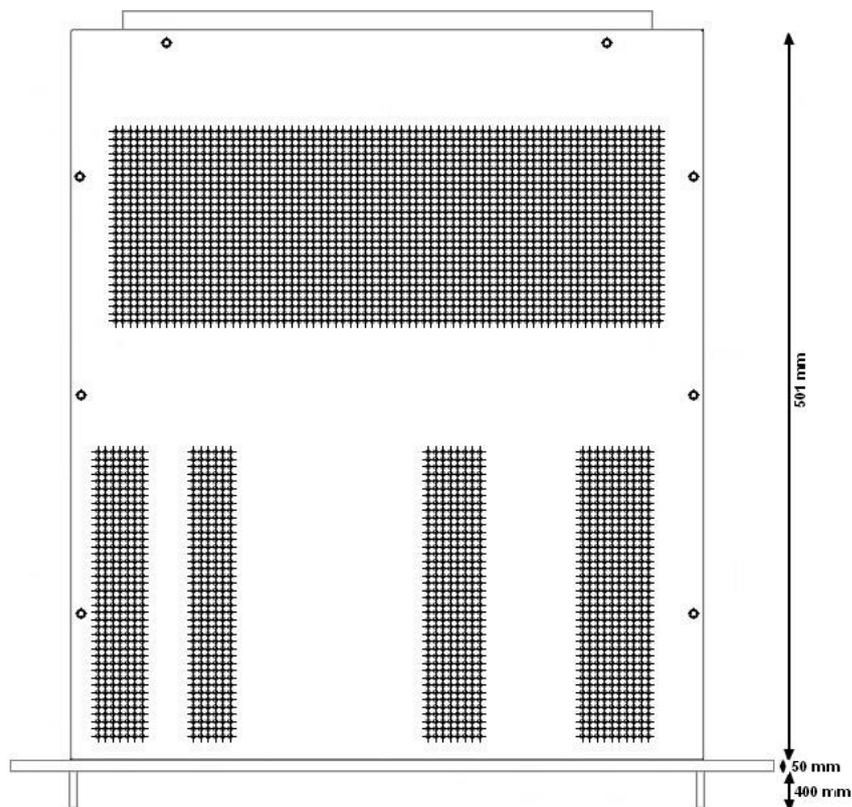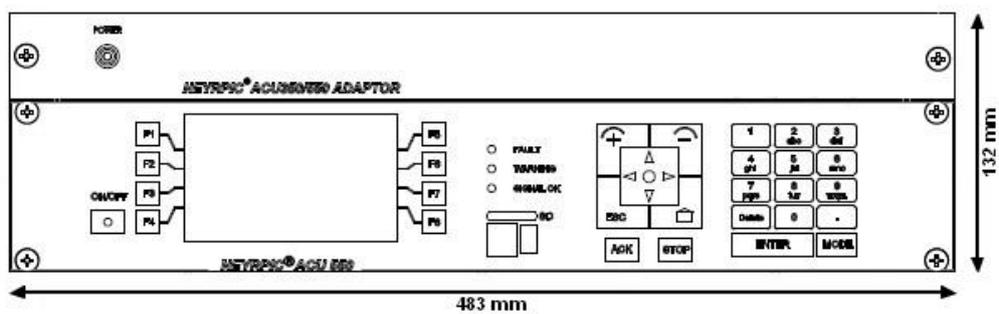
Figure 2: Adaptor top view

Figure 3: Adaptor front view
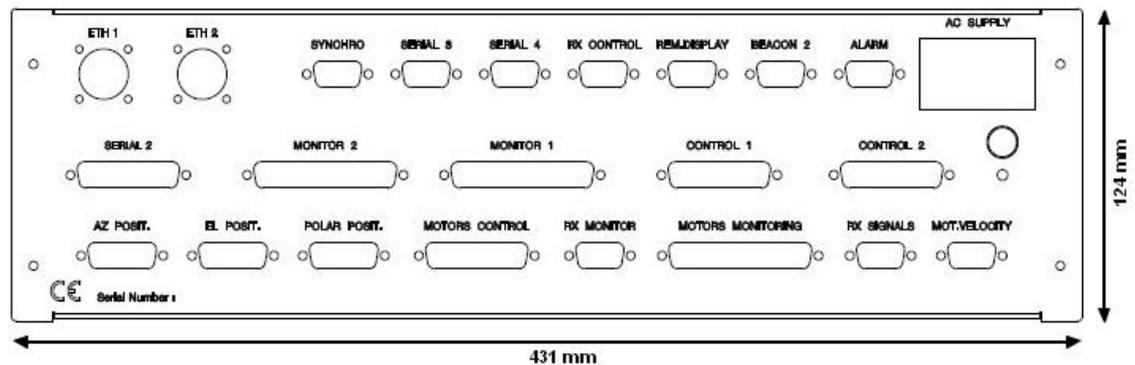
Figure 4: Adaptor rear view

3.5 Compatibility

The Adaptor is compatible with the RCB350 currently used for the old NEYRPIC®4100 system.

The ACU350 parameters configuration can be downloaded from the ACU350 with the ACUParam software. It cannot be uploaded directly to the ACU550. It needs to be manually entered. The STS team can help you migrating your configuration.

3.6 ACU350 and Adaptor differences

The functional differences between an ACU350 and an ACU550 are:

- The old serial bus Q2, used in the ACU350 v3 software version, is not implemented. The bus currently used is the GTS bus for the serial bus.
- The SERIAL3 and SERIAL4 signals are not used by the ACU550 anymore. Cables can still be connected on the back of the Adaptor.
- The ACU550 and ACU350 parameters configurations do not have the same file format. It is not possible to download an ACU350 configuration onto an ACU550 and vice-versa.
- For each axis, the "axis encoder direction" must be inverted between an ACU550 and an ACU350.
- There are pinout differences:
  o All the +15V or -15V pins are not connected any more. Connectors BEACON2, RX SIGNALS and MOT.VELOCITY are impacted by this restriction.
  o The ACU 350 temperature alarm pins are connected inside (pins 2 and 7 of the ALARM connector)..
  o The AZ_ON and EL_ON signals are available on the MONITOR1 connector in the standard Adaptor version.
- RCB350 display is operating with a RS422 link available on REM.DISPLAY connector (Connector REM.DISPLAY 7.2). On the ACU350 installed in the past, it has been detected that wiring was sometimes reversed.

  After installation of Adaptor, if RCB350 display is showing unreadable characters, please reverse wires 3 and 7 on terminal BrRemDisplay on PDU side.

Chapter 4　Installation and configuration

The purpose of this chapter is to explain how to replace an ACU350 installed on a NEYRPIC®4100 system by an ACU350/550 adaptor.

4.1　ACU550 configuration per product version

According to the Adaptor version you have, you must first configure the ACU 550. To do that, simply configure the ACU550 parameter "ACP Link" in the "General system configuration parameters" menu:

- "Ethernet" if the Adaptor is a standard version
- "EthernetPlusAdaptor" if the Adaptor is a full version

4.2　Adapter mounting

The ACU350 and the Adaptor rack do not use the same screw location. Shown below is the differences between the two equipment:

🟩 ACU350 screw location

🟨 ADAPTOR screw location
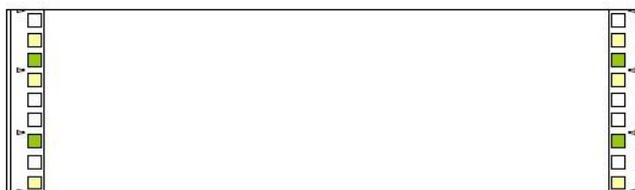
Figure 5: ACU350 and Adaptor screws positioning

4.3　ACU350 configuration migration

The ACU350 and ACU 550 do not have the same configuration file format. You need to configure the ACU550 using the webserver or the front panel. The STS team can help you migrating your configuration.

Differences exist between the ACU 350 and ACU550 configuration. As explained in the paragraph 3.6, the *axis encoder direction* parameters of each axis are inverted.

- Put "Reverse" in the ACU550 axis configuration if the ACU350 parameter is "Forward".
- Put "Forward" in the ACU550 axis configuration if the ACU350 parameter is "Reverse".

4.4　Product rear panel

The ACU 350 and the Adaptor have the same back panels. The location of the connectors is identical on both equipment

It is recommended to reconnect to the Adaptor every cable connected to the ACU350. Do not leave cables unconnected.
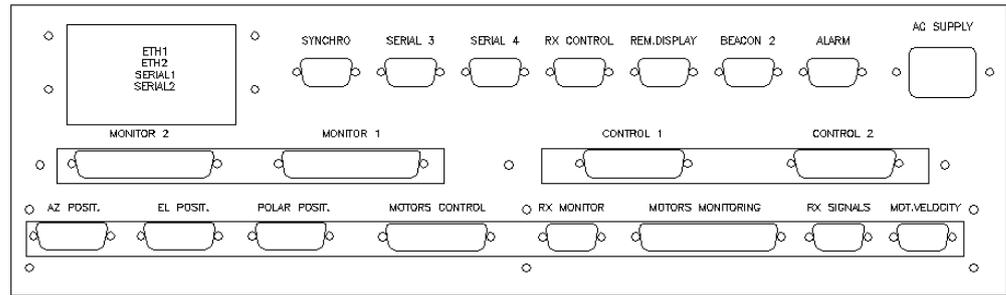
Figure 6: ACU 350 back panel
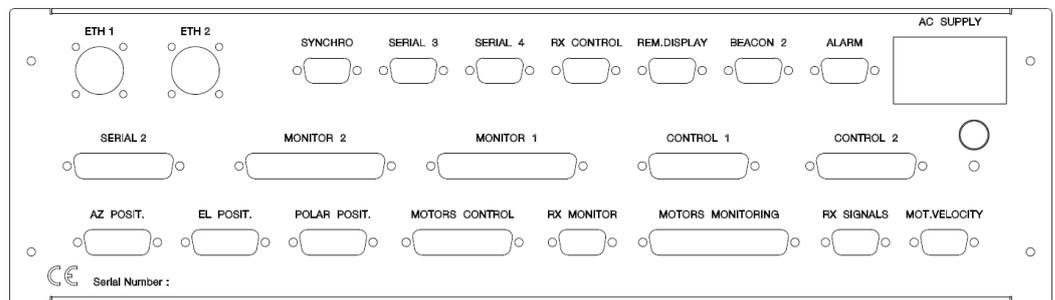
Figure 7: ACU350/550 Adaptor back panel

Chapter 5   How to replace an ACU350 with an adaptor

5.1   Prerequisites

Before replacing the ACU 350, it is recommended to:

- Stop all activities on the ACU 350 and do not change any parameters
- Put the ACU 350 in "Stand-By" mode.
- Note each axis (AZ/EL/POL) positions displayed on the ACU350.
- If you haven't done it, download the ACU 350 parameters configuration by using the ACUParam software. Migrate the configuration to the ACU550 (see doc. R1) for more details on the ACU550 configuration download procedure).

5.2   Remove the ACU350

Here are the steps to remove the ACU 350 from the bay:

- Shutdown the ACU350.

- Switch off the power supply switch on the ACU 350 back panel (near the power supply connector).

- Disconnect the power cord from the ACU 350 rear panel.

- Disconnect all cables from the ACU 350 rear panel

- Unscrew the 4 screws used to attach the ACU 350 to the bay

- Remove the ACU 350 from the bay

5.3   Adaptor installation

Before installing the Adaptor for the first time in an NEYRPIC® 4100 system, you need to change or add the corresponding nuts as explained in the paragraph 4.2.

5.3.1   Adaptor installation

Install the Adaptor in the bay following these steps:

- Place the adaptor in the cabinet
- Take all the signals cables removed from the ACU 350 in paragraph 5.2 and reconnect them on the Adaptor rear panel.
- Screw the 6 Adaptor screws on the cabinet.
- Connect the power cord to the ACU 550
- Switch on the power supply on the Adaptor rear panel. The "POWER" Led on the adaptor front panel turn on.
- Power on the ACU 550 by pressing the "ON/OFF" button on the ACU 550 front panel.
- Verify that the axis positions are the same that you have noted (see paragraph 5.1)

Chapter 6   How to replace the ACU550 in the Adaptor

You can remove the ACU 550 from the Adaptor without removing the Adaptor from the cabinet. It's easier to change the ACU 550 from a completely removed Adaptor.

6.1   ACU550 removal

Here are the steps to remove the ACU 550 from the Adaptor:
- If the Adaptor is in the cabinet:
    - Stop all activities on it
    - Activate the "Stand-By" mode
    - Shut down the power on the ACU 550 by pressing the "ON/OFF" button
    - Switch off the Adaptor from the rear panel and verify that the "POWER" Led on the Adaptor front panel is switched off.
- Unscrew the 4 screws on the ACU 550 and pull it out from of the Adaptor slowly
- Disconnect all the cables from the ACU 550 rear panel before completely removing the ACU550 from the Adaptor.

6.2   ACU550 installation

- Put the ACU550 just in front of the interface rack.
- Reconnect all the cables removed in paragraph 6.1 on the ACU550 rear panel.
    Here is the list of the needed cables:
    - AZ encoder
    - EL encoder
    - POL encoder
    - GPS
    - ACU Monitoring
    - Rx Monitoring
    - Rx Control
    - Rx Signals
    - Power supply
    - ETH5
    - ETH2 or ETH7 (always connect to ETH2)
- Make sure to activate the power switch on the ACU550 rear panel
- Insert the ACU550 in the interface rack
- Screw back the screws you've previously removed.
- If the Adaptor is installed in a cabinet:
    - Switch on the power supply switch on the Adaptor back panel.
    - Verify that the "POWER" Led on the Adaptor front panel is lighted on.
    - Switch on the ACU550 by pressing the "ON/OFF" button on the front panel

Chapter 7   ACU350/550 adaptor pinout

Here is the list of all the Adaptor back panel connectors

Grey Highlights show unconnected pins.

Green Highlights show differences between ACU350 and Adaptor/ACU550

7.1   Connector ALARM

Connector type: Sub-D9 male

Function: Alarm contact

pin		ACU 350 signal	name	Comments
				

Connector ALARM				
pin		ACU 350 signal	name	Comments
1		RL9/14	ALARM NO	N/O contact (open in case of ACU fault or shutdown)
	6	RL9/11	ALARM C	
2		SW2	Temp NO	Not used.
	7	SW2	Temp C	Pins are connected inside the Adaptor
3				
	8			
4				
	9			
5				

7.2   Connector REM.DISPLAY

Connector type: Sub-D9 male

Function: IRIG-B serial link and RCB serial link for positions and beacon signal display

Connector REM.DISPLAY				
pin		ACU 350 signal	name	Comments
1				
	6			
2		Rx-	Entrée- IRIG-B	
	7	Tx-	Entrée- Affichage RCB	
3		Tx+	Entrée+ Affichage RCB	
	8	Rx+	Entrée+ IRIG-B	
4				
	9			
5				

7.3 Connector SYNCHRO

Connector type: Sub-D9 male

Function: second synchronization top for IRIG-B time management

pin		ACU 350 signal	name	Comments
Connector SYNCHRO				
1				
	6			
2		Rx-	Signal de synchro-	
	7			
3		Rx+	Signal de synchro+	
	8			
4				
	9			
5				

7.4 Connector SERIAL2

Connector type: Sub-D25 female

Function: Rs232 link for GTS remote control management

pin		ACU 350 signal	name	Comments
Connector SERIAL2				
1				
	14			
2		GTS_TX		
	15			
3		GTS_RX		
	16			
4				
	17			
5		GND		
	18			
6				
	19			
7				
	20			
8				
	21			
9				
	22			
10				
	23			
11				
	24			
12				
	25			
13				

7.5 Connector AZ POSIT

Connector type: Sub-D15 female

pin		ACU 350 signal	name	Comments
1		+24V		
	9	+24V		24V delivered by the ACU
2		+24V		
	10	0V		
3		0V		0V associated to the 1-2-9 pins
	11	0V		
4				
	12	VAL-N		Reverse loading
5		VAL		Loading
	13	H-N		Reverse clock
6		H		Clock
	14	GND		
7		Data		Data
	15	Data-N		Reverse Data
8				

7.6 Connector EL POSIT

Connector type: Sub-D15 female

pin		ACU 350 signal	name	Comments
1		+24V		
	9	+24V		24V delivered by the ACU
2		+24V		
	10	0V		
3		0V		0V associated to the 1-2-9 pins
	11	0V		
4				
	12	VAL-N		Reverse loading
5		VAL		Loading
	13	H-N		Reverse clock
6		H		Clock
	14	GND		
7		Data		Data
	15	Data-N		Reverse Data
8				

7.7 Connector POL POSIT

Connector type: Sub-D15 female

Connector POL POSIT			
pin	ACU 350 signal	name	Comments
1	+24V		24V delivered by the ACU
9	+24V		
2	+24V		
10	0V		0V associated to the 1-2-9 pins
3	0V		
11	0V		
4			
12	VAL-N		Reverse loading
5	VAL		Loading
13	H-N		Reverse clock
6	H		Clock
14	GND		
7	Data		Data
15	Data-N		Reverse Data
8			

7.8   MOTORS MONITORING

Connector type: Sub-D37 male

Function: motors alarms and status monitoring

pin	ACU 350 signal	name	Comments
1	ETOR 19	ACK	
20			
2	ETOR 18	MAINT	
21			
3	ETOR 17	GVAZ2_OK	
22			
4	ETOR 16	GVAZ1_OK	
23			
5	ETOR 15	FC_AZ-	
24			
6	ETOR 14	FC_AZ-	
25			
7	ETOR 13	DFRAZ	
26			
8	ETOR 12	PVAZ_OK	
27			
9	ETOR 11	GVEL2_OK	
28			
10	ETOR 10	GVEL1_OK	
29			
11	ETOR 9	FC_EL-	
30			
12	ETOR 8	FC_EL+	
31			
13	ETOR 7	DFREL	
32	0V		
14	ETOR 6	PVEL_OK	
33	0V		
15	ETOR 5	POL_OK	
34	0V		
16	ETOR 4	FC_POL-	
35	ETOR 22	CCW_SECTOR	
17		FC_POL+	
36	ETOR 21	CW_SECTOR	
18	ETOR 2	AUXIL_OK	
37	ETOR 20	SURVIE	
19	ETOR 1	PUISS_OK	

7.9 MOTORS CONTROL

Connector type: Sub-D25 male

Function: motor control contacts

			Connector MOTORS CONTROL		
pin	ACU 350 signal	name	Comments
1	STOR 1 PV_GV AZ	NC	
14		NO	
2		C	
15	STOR 2 PV_GV EL	NC	
3		NO	
16		C	
4	STOR 3 AZ+	NC	
17		NO	
5		C	
18	STOR 4 AZ-	NC	
6		NO	
19		C	
7	STOR 5 EL+	NC	
20		NO	
8		C	
21	STOR 6 EL-	NC	
9		NO	
22		C	
10	STOR 7 POL+	NC	
23		NO	
11		C	
24	STOR 8 POL-	NC	
12		NO	
25		C	
13			

7.10 MOT. VELOCITY

Connector type: Sub-D9 female

Function: motor speed control

Connector MOT. VELOCITY			
pin	ACU 350 signal	name	Comments
1	SANA3+	POL consigne	
6	-15V		Unconnected
2	SANA2-	EL consigne reference	
7	0V		
3	SANA2+	EL consigne	
8	+15V		Unconnected
4	SANA1-	AZ consigne reference	
9	SANA3-	POL consigne reference	
5	SANA1+	AZ consigne	

ⓘ   The -15V and +15V are not supplied on pin 6 and 8 respectively.

7.11 RX MONITORING

Connector type: Sub-D9 male

Function: APA and receiver alarm monitoring

Connector RX MONITORING			
pin	ACU 350 signal	name	Comments
1			
6			
2			
7			
3	0V		
8			
4	ETOR 24	RX_LOCK	
9			
5	ETOR 23	RX_OK	

7.12 RX CONTROL

Connector type: Sub-D9 female

Function: serial communication with the receiver

Connector RX CONTROL			
pin	ACU 350 signal	name	Comments
1			
6			
2	Tx		Receiver Rs232 transmit link
7			
3	Rx		Receiver Rs232 receive link
8			
4			
9			
5	GND		

7.13 RX SIGNALS

Connector type: Sub-D9 male

Function: beacon signals

Connector RX SIGNALS			
pin	ACU350 signal	name	Comments
1	EANA3+	EL angle error measurement	
6	-15V		Connected to ACU550 0V
2	EANA2-	AZ angle error measurement ref	
7	0V		
3	EANA2+	AZ angle error measurement	
8	+15V		Connected to ACU550 24V
4	EANA1-	Beacon signal ref	
9	EANA3-	EL angle error measurement ref	
5	EANA1+	Beacon signal	

The pin 6 and 8 are now supplying 0V and 24V respectively.

7.14 BEACON2

Connector type: Sub-D9 male

Function: beacon signals

		Connector BEACON2		
pin	ACU350 signal	name	Comments
1	EANA4+	POL angle error measurement	
6	EANA4-	POL angle error measurement ref	
2			
7			
3			
8			
4	+15V		Unconnected
9	0V		Unconnected
5	-15V		Unconnected

The +15V, OV and -15V are not supplied on pin 4, 9 and 5 respectively.

7.15 MONITOR1

Connector type: Sub-D37 male

The use of the pins highlighted differs according to the version of the Adaptor:

- Standard: pins are unconnected
- Full: consider the comment for pin description

		Connector MONITOR1		
pin	ACU 350 signal	name	Comments
1	ETOR 43	SW3_POS1	SW3_POS1 or ETOR 43
20			
2	ETOR 42	SW4_POS2	SW4_POS2 or ETOR 42
21			
3	ETOR 41	SW4_POS1	SW4_POS1 or ETOR 41
22			
4	ETOR 40	SW5_POS2	SW5_POS2 or ETOR 40
23			
5	ETOR 39	SW5_POS1	SW5_POS1 or ETOR 39
24			
6	ETOR 38	SW6_POS2	SW6_POS2 or ETOR 38
25			
7	ETOR 37	SW6_POS1	SW6_POS1 or ETOR 37
26			
8	ETOR 36	FDCVER2	FDCVER2 or ETOR 36
27			
9	ETOR 35	FDCVER1	FDCVER1 or ETOR 35
28			
10	ETOR 34	FCVER2	FCVER2 or ETOR 34
29			

pin	ACU 350 signal	name	Comments
11	ETOR 33	FCVER1	FCVER1 or ETOR 33
30			
12	ETOR 32	VER2_OK	VER2_OK or ETOR 32
31			
13	ETOR 31	VER1_OK	VER1_OK or ETOR 31
32	0V		
14	ETOR 30	ETOR30	Same as ACU 350
33	0V		
15	ETOR 29	ETOR 29	Same as ACU 350
34	0V		
16	ETOR 28	AZ2_OK	AZ2_OK or ETOR 28
35	0V		
17	ETOR 27	AZ1_OK	AZ1_OK or ETOR 27
36			
18	ETOR 26	EL2_OK	EL2_OK or ETOR 26
37	ETOR 44	SW3_POS2	SW3_POS2 or ETOR 44
19	ETOR 25	EL1_OK	EL1_OK or ETOR 25

7.16   MONITOR2

Connector type: Sub-D37 male

The use of the pins highlighted differs according to the version of the Adaptor:
- Standard: pins are unconnected
- Full: consider the comment for pin description

Connector MONITOR2			
pin	ACU 350 signal	name	Comments
1	ETOR 63	Autocal_OK	Autocal_OK or ETOR 63
20			
2	ETOR 62	LUB_ON	LUB_ON or ETOR 62
21			
3	ETOR 61	PASS_GRAISS_ON	PASS_GRAISS_ON or ETOR 61
22			
4	ETOR 60	ETOR 60	Same as ACU 350
23			
5	ETOR 59	RX_SIM1/2	RX_SIM1/2 or ETOR 59
24			
6	ETOR 58	RX_CIRLIN	RX_CIRLIN or ETOR 58
25			
7	ETOR 57	DC_ALARM	DC_ALARM or ETOR 57
26			
8	ETOR 56	LNA3_2	LAN3_2 or ETOR 56
27			
9	ETOR 55	LNA2_2	LNA2_2 or ETOR 55
28			
10	ETOR 54	LNA3_1	LNA3_1 or ETOR 54
29			
11	ETOR 53	LNA1_1	LNA1_1 or ETOR 53
30			
12	ETOR 52	LNA3_OK	LNA3_OK or ETOR 52
31			
13	ETOR 51	LNA2_OK	LNA2_OK or ETOR 51
32	0V		

14	ETOR 50	LNA1_OK	LNA1_OK or ETOR 50
33	0V		
15	ETOR 49	LNA_ECARTO	LNA_ECARTO or ETOR 49
34	0V		
16	ETOR 48	SW2_POS2	SW2_POS2 or ETOR 48
35	0V		
17	ETOR 47	SW2_POS1	SW2_POS1 or ETOR 47
36			
18	ETOR 46	SW1_POS2	SW1_POS2 or ETOR 46
37	ETOR 64	AlimRx_Path	AlimRx_Path or ETOR 64
19	ETOR 45	SW1_POS1	SW1_POS1 or ETOR 45

7.17 CONTROL1

Connector type: Sub-D25 male

The use of the pins highlighted differs according to the version of the Adaptor:
- Standard: pins are unconnected
- Full: consider the comment for pin description

Connector CONTROL1			
pin	ACU 350 signal	name	Comments
1		NC	Same as ACU 350
14	STOR 9 AZ_ON	NO	Same as ACU 350
2		C	Same as ACU 350
15		NC	Same as ACU 350
3	STOR 10 EL_ON	NO	Same as ACU 350
16		C	Same as ACU 350
4		NC	Same as ACU 350
17	STOR 11 VER_ON	NO	Same as ACU 350
5		C	Same as ACU 350
18		NC	Same as ACU 350
6	STOR 12 DVER_ON	NO	Same as ACU 350
19		C	Same as ACU 350
7		NC	Same as ACU 350
20	STOR 13 SW5_POS2	NO	Same as ACU 350
8		C	Same as ACU 350
21		NC	Same as ACU 350
9	STOR 14 SW5_POS1	NO	Same as ACU 350
22		C	Same as ACU 350
10		NC	Same as ACU 350
23	STOR 15 SW6_POS2	NO	Same as ACU 350
11		C	Same as ACU 350
24		NC	Same as ACU 350
12	STOR 16 SURVIE	NO	Same as ACU 350
25	SW6_POS1	C	Same as ACU 350
13			

7.18   CONTROL2

Connector type: Sub-D25 male

The use of the pins highlighted differs according to the version of the Adaptor:
- Standard: pins are unconnected
- Full: consider the comment for pin description

Connector CONTROL2			
pin	ACU 350 signal	name	Comments
1	STOR 17 GRAISS_ON SW4_POS2	NC	Same as ACU 350
14		NO	Same as ACU 350
2		C	Same as ACU 350
15	STOR 18 SW4_POS1	NC	Same as ACU 350
3		NO	Same as ACU 350
16		C	Same as ACU 350
4	STOR 19 SW3_POS2	NC	Same as ACU 350
17		NO	Same as ACU 350
5		C	Same as ACU 350
18	STOR 20 SW3_POS1	NC	Same as ACU 350
6		NO	Same as ACU 350
19		C	Same as ACU 350
7	STOR 21 SW2_POS2	NC	Same as ACU 350
20		NO	Same as ACU 350
8		C	Same as ACU 350
21	STOR 22 SW2_POS1	NC	Same as ACU 350
9		NO	Same as ACU 350
22		C	Same as ACU 350
10	STOR 23 SW1_POS2	NC	Same as ACU 350
23		NO	Same as ACU 350
11		C	Same as ACU 350
24	STOR 24 SW1_POS1	NC	Same as ACU 350
12		NO	Same as ACU 350
25		C	Same as ACU 350
13			

7.19   ETH1

Connector type: RJ45 base T

Connexion: inverted or straight Ethernet cable

Function: Ethernet ONC/RPC remote control management

7.20   ETH2

Currently not connected

7.21   SERIAL3

Currently not connected

7.22   SERIAL4

Currently not connected