

BECKER AVIONICS

Audio Control Unit

ACU6100

Installation and Operation

Manual DV64440.03

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Contact data for:

**Europe, Asia,
Oceania and
Africa** **Becker Avionics GmbH**
Baden-Airpark B108
77836 Rheinmünster (Germany)
Tel.: + 49 (0) 7229 / 305-0
Fax: + 49 (0) 7229 / 305-217
Internet: www.becker-avionics.com
Email: info@becker-avionics.com

Customer Service:

Email: support@becker-avionics.com

Contact data for:

**America,
Australia, Japan** **Becker Avionics Inc.**
Email: info@beckerusa.com



WARNING - USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Becker Avionics provide product or system options for further investigation by users having technical knowledge.

The user is responsible for making the final selection of the system and components. The user has to assure that all performance, endurance, maintenance, safety requirements of the application are met and warnings be obeyed.

For this the user has to include all aspects of the application to be compliant with the applicable industry standards and the requirements of the responsible aviation authority. The product documentations from Becker Avionics have to be obeyed.

To the extent that Becker Avionics provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Term definition: User in the sense of user, installer, installation company.

Preface

Dear Customer,

Thank you for purchasing a Becker Avionics product. We are pleased that you have chosen our product and we are confident that it will meet your expectations.

For development and manufacturing of our product, the guidelines for highest quality and reliability have been borne in mind, supplemented by selection of high-quality material, responsible production and testing in accordance to the standards.

Our competent customer support department will respond on any technical question you may have. Please do not hesitate to contact us at any time.

ACU - Audio Control Unit*



ACU6100

* design depends on variant.

* Some figures in this manual are for basic understanding and can be different to the actual design.

List of Effective Pages and Changes

Only technical relevant modifications are described in this table.

Document: DV64440.03 issue 09		Article Number 0589.845-071	
Cover Page	11/2019		
Introduction	11/2019		
Chapter 1 – 4	11/2019		
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09	1-64	all	Updated: Editorial adjustments.
	--	1.8.9	Updated: Environmental conditions
	--	2.5.1	Updated: Connector description P1.
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List of Abbreviations

List of Abbreviations

AC	Advisory Circular
AC	Alternating Current
ACU	Audio Control Unit
ADF	Automatic Direction Finder
AF	Audio Frequency
AGC	Automatic Gain Control
Amp.	Amplifier
ARINC	Aeronautical Radio Incorporated
AWG	Air Wire Gauge
BIT	Built-In-Test
BITE	Built-In-Test-Equipment
CAN	CANbus
CBIT	Continuous Build-In Test
COM	Radio Transceiver
CPU	Central Processing Unit
CSW	Configuration Software
CVR	Cockpit Voice Recorder


List of Abbreviations


DC	Direct Current
DIN	Deutsche Industrie-Norm
DME	Distance Measuring Equipment
DSP	Digital Signal Processing
DV	Druckvorschrift (manual designation)
DVCS	Digital Voice Communication System
DZUS	Turnlock fasteners (inventor - William Dzus)
EASA	European Aviation Safety Agency Europäische Agentur für Flugsicherheit
EN	European Norm
EMER	Emergency Operation, Back-up Operation
ESD	Electro-Static Sensitive Device
EUROCAE	European Organization for Civil Aviation Electronics
FAA	Federal Aviation Administration
FIX	Fixed Input
FM	Frequency Modulation
GND	Ground
HF	High Frequency
HI	High
IBIT	Initiated Build-In Test
IC	Intercom, Intercommunication
ISO	International Standard Organization
ISO/CALL	Intercom Request Call
Mic	Microphone
Mike	Microphone
MKR	Marker Receiver
Out	Output
PA	Public Address
PBIT	Power-on Build-In Test
Pos.	Position
PTT	Push-To-Talk
REU	Remote Electronic Unit
RF	Radio Frequency
RTCA	Radio Technical Commission for Aeronautics
RX	Receiver
SPKR	Loudspeaker
TX	Transmitter, Transmission
VOX	Voice Operated Switch


Units


Units	
A	Ampere
mA	Milliampere
°C	Degree Celsius
cm	Centimeter
cd/m ²	Candela Per Square Meter (1 cd/m ² = 1 nit)
dBm	Power Ratio In Decibel referenced to 1 mW
dB	Decibel
g	Gram
kg	Kilogram
kHz	Kilohertz
MHz	Megahertz
mm	Millimeter
Nm	Newton Meter
NM	Nautical Mile (1NM = 1852,0 m)
Ohm (Ω)	Resistance
s	Second
V	Volt
mV	Millivolt
W	Watt
mW	Milliwatt
"	Inch


General Safety Definitions

 **DANGER** Indicates a hazardous situation which, if not prevented, will result in death or serious injury.

 **WARNING** Indicates a hazardous situation which, if not prevented, could result in death or serious injury.

 **CAUTION** Indicates a hazardous situation which, if not prevented, could result in minor or moderate injury.

 **NOTICE** Is used to address practices not related to physical injury.

 **SAFETY INSTRUCTIONS** Safety instructions (or equivalent) signs indicate specified safety-related instructions or procedures.

Disposal

⚠CAUTION The packaging material is inflammable, by burning toxic fumes may develop.

This product contains materials that fall under the special disposal regulation. We recommend the disposal of such materials in accordance with the current environmental laws.

- Dispose circuit boards by a technical waste dump which is approved to take on e.g. electrolytic aluminium capacitors. Do under no circumstances dump the circuit boards with normal waste dump.

Warranty Conditions

⚠CAUTION The device(s) may be installed on an aircraft only by an approved aeronautical company (e.g. Part 145) which shall also examine the installation.

Any change made by the user excludes any liability on our part (excluding the work described in this manual).

- The device must not be opened.
- Do not make any modifications to the device, except for those described in the manual.
- Make connections to the inputs, outputs and interfaces only in the manner described in the manual.
- Install the devices according to the instructions.
We cannot give any guarantee for other methods.

Conditions of Utilization

With this device you bought a product which was manufactured and tested before delivery with the utmost care.

Please take your time to read the instructions which you ought to follow closely during installation and operation.

Otherwise all claims under the warranty will become void and a decreased service life or even damages must be expected.

⚠CAUTION The user is responsible for protective covers and/or additional safety measures in order to prevent damages to persons and electric accidents.

Additional Conditions of Utilization

Please refer to "Safety-Conscious Utilization", page 18.

Non-Warranty Clause

We checked the contents of this publication for compliance with the associated hard and software. We can, however, not exclude discrepancies and do therefore not accept any liability for the exact compliance. The information in this publication is regularly checked, necessary corrections will be part of the subsequent publications.

1 General Description

In this chapter you can read about:

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This manual describes the Becker Audio Control Unit ACU6100. The type plate on your device shows the part number for identification purposes (see "Type Plate", page 27).

Before starting operation of the device(s) please read this manual carefully, with particular attention to the description referring to your device(s).

Purpose of Equipment

1.1 Introduction

The technical information in this document applies to the product and variants of ACU6100.

- We also use the term ACU6100 or ACU61 for descriptions instead writing the complete model number.
- If a description refers to only one of the product variants its full name is used or it is specified accordingly.

The manuals "Maintenance and Repair" (**M&R**), "Installation and Operation (**I&O**) and "Operation Instructions" (**OI**) contain the sections:

Section	DV64440.04 M&R	DV64440.03 I&O	0590.363-071 OI
General	X	X	-
Installation	X	X	-
Operation	X	X	X
Theory of Operation	X	N/A	N/A
Maintenance and Repair	X	N/A	N/A
Illustrated Parts List	X	N/A	N/A
Modification and Changes	X	N/A	N/A
Circuit Diagrams	X	N/A	N/A
Certifications	X	N/A	N/A
Attachments	X	N/A	N/A

1.2 Purpose of Equipment

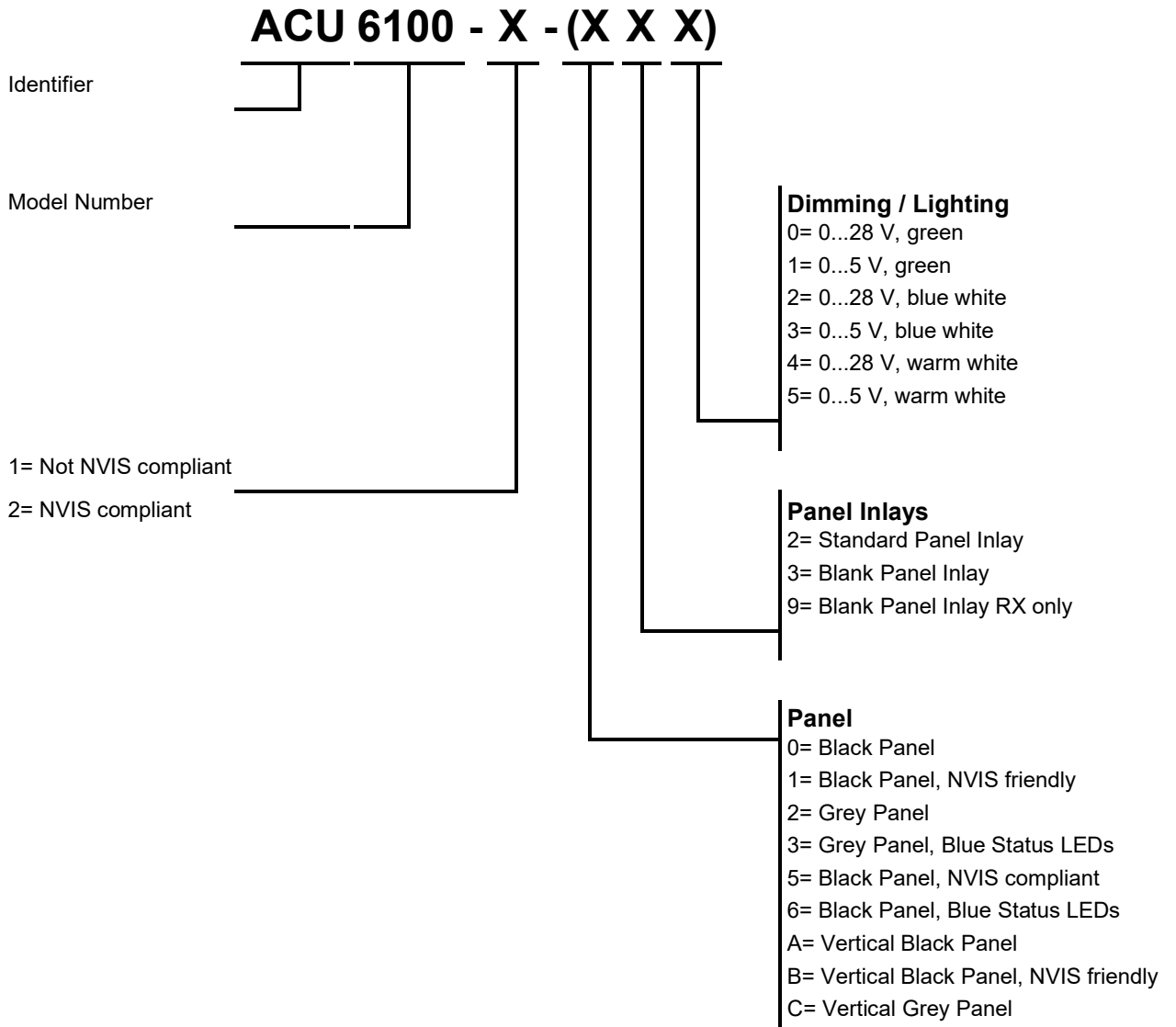
The Audio Control Unit is part of the Digital Voice Communication System DVCS 6100 and is for installation in the operator console of an aircraft.

It is for the control of the Remote Electronic Unit REU6100. Together with the Remote Electronic Unit REU6100 it is the intercom system of the aircraft.

- A maximum of six audio control devices can be connected to a Remote Electronic Unit REU6100.

1.3 Variants Overview

1.3.1 ACU6100-X-(XXX)



Example:

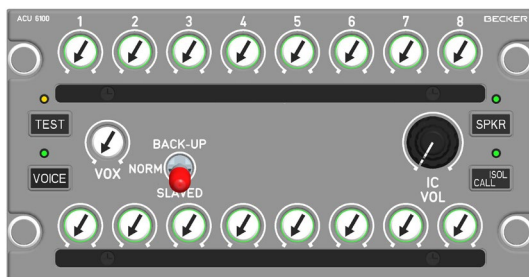
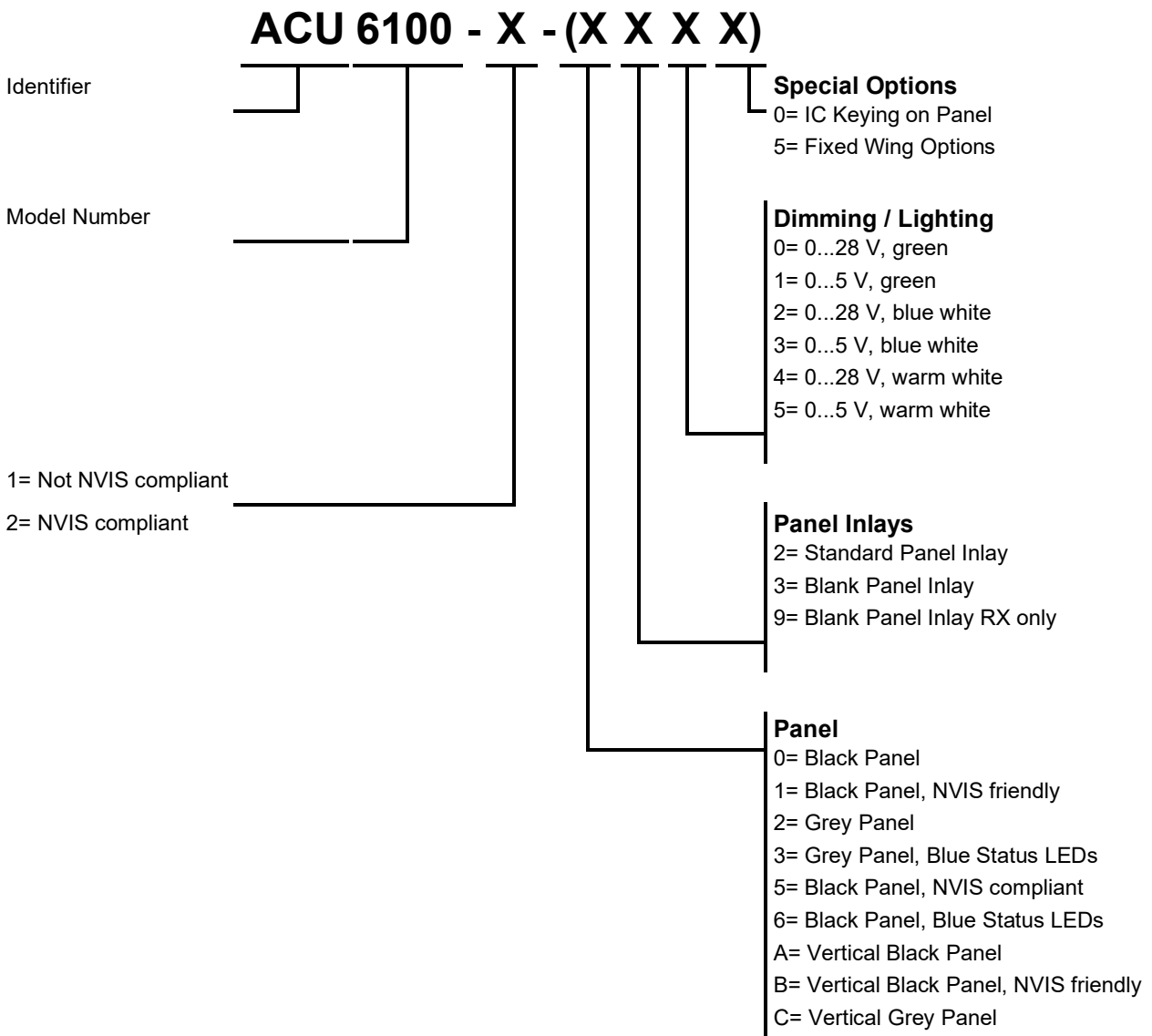


Figure 1: ACU6100-X-(X9X) - RX Variant

1.3.2 ACU6100-X-(XXXX)



Examples:

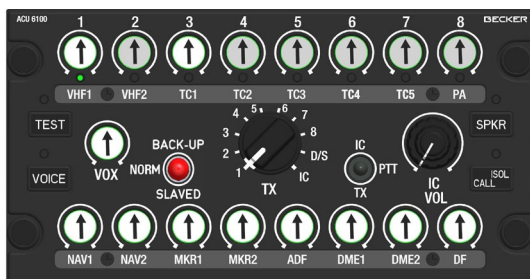


Figure 2: ACU6100-X-(XXX0) - Rotary Wing Variant

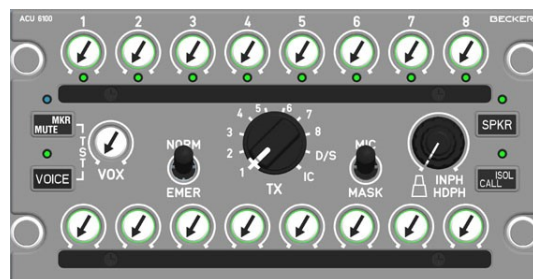


Figure 3: ACU6100-X-(XXX5) - Fixed Wing Variant

1.3.3 Software Status

Descriptions see "Software/Firmware Status – Functionality", page 28.

1.4 Associated Devices

These devices can operate with ACU6100:

Device	Function
ACU6100	Becker Avionics Audio Control Unit
ACU6101	Becker Avionics Audio Control Unit
REU6100	Becker Avionics Remote Electronic Unit

This manual describes the ACU6100 and its variants with REU6100 from Becker Avionics. For other devices please refer to the related manuals.

1.4.1 Overview

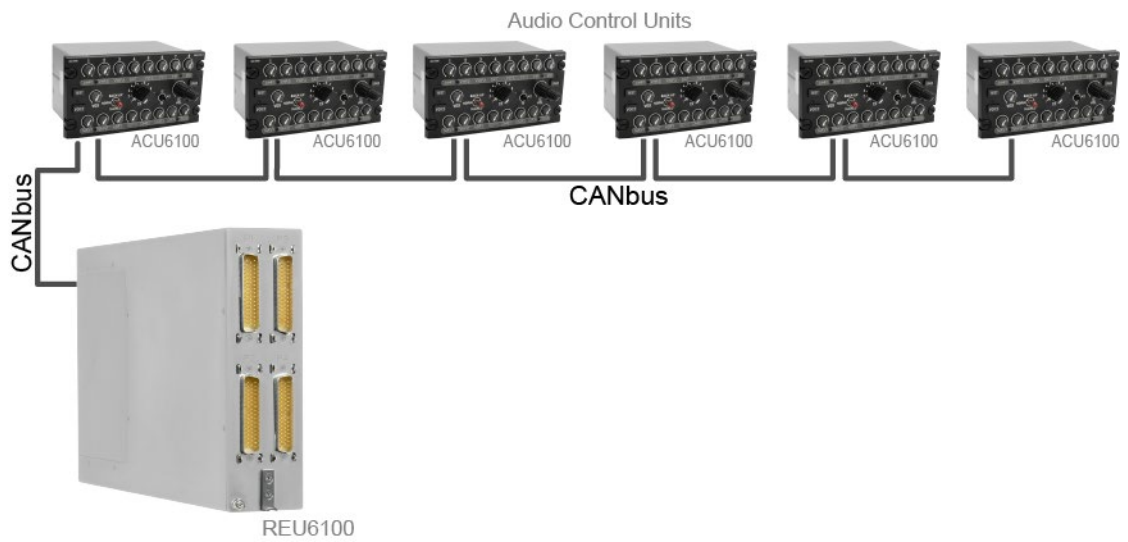


Figure 4: DVCS6100 Application with six ACU6100

1.5 Scope of Functionality

- The ACU6100 is a single block device made for operation in the operator console of fixed wing and rotary wing aircraft.
- All controls and indicators are on the front panel. The equipment connectors are at the rear side of the device.
- The dimensions agree with the ARINC 601 standard dimensions for control devices.
- Installation with four DZUS fasteners.
- The labels of the key caps, rotary switch, and increment sensor are in white translucent characters.
- The Illumination is available in different colors see "Variants Overview" page 13.

1.5.1 Control Elements

- 1 rotary switch (10 positions), to select the active transceiver, the public address or intercom mode. Also, to select dual or multi transmission mode if available (depends on variant).
- 1 switch (lockable) for selection of the operation mode:
 - Normal operation.
 - Emergency operation (back-up operation).
 - Slaved operation (depends on variant).
- 1 toggle switch for PTT and IC operation (depends on variant).
- 1 double rotary knob to set the individual main volume (outer rotary knob) and the individual IC volume (inner rotary knob).
- 1 VOX rotary knob to set VOX function on/off and to set the individual VOX-threshold level.
- 8 push knobs with potentiometer function to set the transceiver monitoring on/off and for individual channel volume control.
- 8 push knobs with potentiometer function to set the receiver monitoring on/off and for individual channel volume control.
- 1 VOICE key with LED to set the ident filter on/off.
- 1 TEST key with yellow LED to start the IBIT (depends on variant).
- 1 MKR/MUTE key to start the marker mute function (depends on variant).
- 1 SPKR key with LED to set the speaker on/off.
- 1 ISOL /CALL key with LED to control the intercom functions between cockpit and cabin.

1.5.2 In/Outputs

- Control of up to 8 transceivers or 7 transceivers plus one public address (PA) amplifier.
- Indication of transmission via status lights.
- Monitoring of up to 8 transceivers with a capability of individual volume control.
- Monitoring of up to 8 receivers with a capability of individual volume control.
- Monitoring of up to 6 fixed inputs.
- Main volume control.

1.5.3 Intercom Function

- 2 intercom circuits for cockpit and cabin communication.
- Function to connect or disconnect (isolate) the intercom circuits.
- Aircraft intercommunication in VOX or PTT-controlled mode.
- Optical call indication for intercom request plus acoustical call alert.

1.5.4 Signal Tones

- Monitoring of up to 10 signal tones. 8 tones can be activated by discrete control lines from external (aural alert tones).

1.5.5 Built-In Tests

- The ACU61 device has different built-in tests with optical indication of the test results.
- The tests monitor the system equipment and some internal circuits.
 - PBIT: A system self-test starts after power-on.
 - CBIT: A background test routine runs continuously during normal operation.
 - IBIT: An additional test can be manually started.

1.5.6 Emergency Operation (Back-Up Operation)

- The emergency operation (back-up operation) can be started manually through the selection switch for the back-up function on the ACU61.
- If there is total power failure, the headsets of pilot and copilot are automatically connected to:
 - Headset 1 (normally the pilot) is connected to TX1 and FIX1.
 - Headset 2 (copilot) to TX2 and FIX2.
- The selection switch for the back-up function is not connected through the interface it must be hardwired.

1.5.7 Slave Operation

- If there is a total loss of pilots or copilots ACU61 (ACU1, ACU2), the device can be connected in parallel to the remaining ACU61 through the slaved mode.
- The selection switch for the SLAVE function is not connected through the interface it must be hardwired.

1.5.8 Interface

- Control data are transferred through a redundant CANbus interface.

1.5.9 Special Functions

- Audio Control Units are factory configurable to different operation profiles, e.g. disabling certain transceiver or receiver accessibility in the cabin / passenger area.

1.6 Safety-Conscious Utilization

⚠ CAUTION The device(s) may be installed on an aircraft only by an approved aeronautical company (e.g. Part 145) which shall also examine the installation.

SAFETY INSTRUCTIONS

- The installation of the device into an aircraft may be carried out only by an authorized installation company. The country regulations always have to be obeyed.
- Use the product only in the specified conditions, see "Technical Data", page 19.
- Power supply:
 - Do not connect the device to AC sources.
 - Make sure that the device is connected to the mandatory DC source, see "Technical Data", page 19.
 - Do not connect the device with reversed polarity to the DC source.
- Circuit breaker:
 - Use the recommended fuses in the power supply line for protection of the application, see "Technical Data", page 19.

NOTICE

Cleaning:

- Do not use aggressive cleaning agents e.g. Acetone.
 - These cleaning agents can cause damages.

NOTICE

Excessive pulses on the DC bus of the aircraft may cause damage on electrical circuits of any installed instrument.

Do not power-on the device during engine start or shutdown.

1.7 Restriction for Use

SAFETY INSTRUCTIONS

The product is to be used inside the declared limits.

1.8 Technical Data

1.8.1 General Characteristics

ACU6100	Specifications
Supply voltage (Bus) I	27.5 VDC nominal 18.0 VDC emergency
Supply voltage (Bus) II	27.5 VDC nominal 18.0 VDC emergency
Power consumption	≤ 150 mA inclusive Illumination
Dim control input 1	max. 27.5 VDC (panel illumination)
Dim control input 2	max. 27.5 VDC (LED brightness)
Recommended external fuse protection	2 A T

1.8.2 Control Data Interface ACU-REU

ACU6100	Specifications
Interface	CANbus
Protocol	Becker specific (Becker Bus Protocol proprietary)

1.8.3 Control Inputs (Discrete)

ACU6100	Specifications
PTT	low active ≤ 0.3 V
Hot mike in	low active ≤ 0.3 V

1.8.4 Dimensions & Weight

ACU6100	Specifications
Dimensions HxWxD	75.8 x 145.8 x 91.5 mm
Installation depth	77.5 mm
Weight	≤ 800 g
Standard	ARINC 601, 8 HE
Case material	AlMg
Installation	DZUS fasteners

1.8.5 Device Connectors

ACU6100	Specifications
Device connector	1x 10pol male, bayonet
Control bus connector	1x 19pol male, bayonet

1.8.6 Software

In accordance with EUROCAE / RTCA document ED-12B/DO-178B the software is specified as:

LEVEL C

1.8.7 Hardware

The device does not contain Complex Electronic Hardware (CEH).

1.8.8 Continued Airworthiness

A regular maintenance is not necessary.

1.8.9 Environmental Conditions

The tests were done in accordance with ED-14E/DO-160E under consideration of the recorded environmental categories and conditions:

Environmental Condition	Section	Cat.	Remarks
Temperature and Altitude	4	D1	-
Ground Survival Low Temperature	4.5.1	D1	-55 °C
Operating Low Temperature	4.5.2	D1	-40 °C
Ground Survival High Temperature	4.5.3	D1	+85 °C
Short-Time Operating High Temperature	4.5.3	D1	+70 °C
Operating High Temperature	4.5.4	D1	+70 °C
In-flight Loss of Cooling	4.5.5	X	no auxiliary cooling required
Altitude	4.6.1	D1	50 000 ft
Temperature Variation	5	B	5 °C per minute
Humidity	6	B	48 h at 65 °C at 95% RH
Operational Shocks	7.2	B	6 g in all directions
Crash Safety	7.3	B	20 g shock; 20 g acceleration
Vibration	8	S U	M G
Explosion Atmosphere	9	X	no test performed
Waterproofness	10	X	no test performed
Fluids Susceptibility	11	X	no test performed
Sand and Dust	12	X	no test performed
Fungus Resistance	13	X	no test performed
Salt Fog	14	X	no test performed
Magnetic Effect	15	Z	less than 0.3 m
Power Input	16	B	-
Voltage Spike	17	A	-
Audio Freq. Conducted Susceptibility	18	B	-
Induced Signal Susceptibility	19	AC	-
Radio Frequency Susceptibility	20	WR	-
Emission of Radio Frequency Energy	21	M	-
Lightning Induced Transients Susceptibility	22	A3E3X	-
Lightning Direct Effects	23	X	no test performed
Icing	24	X	no test performed
Electrostatic Discharge (ESD)	25	A	-
Fire, Flammability	26	X	no test performed

Technical Data

1.8.10 Certifications

ACU6100-X-() meets the requirements of:

	Specifications
EASA	ETSO-C50c
FAA	TSO-C139

1.9 Order Code**1.9.1 ACU6100**

Qty	Device	
1	ACU6100-1-(0320)	Article-No. 0608.092-921
1	ACU6100-1-(034)	Article-No. 0614.750-921
1	ACU6100-1-(035)	Article-No. 0615.821-921
1	ACU6100-1-(0350)	Article-No. 0619.329-921
1	ACU6100-1-(232)	Article-No. 0597.678-921
1	ACU6100-1-(2330)	Article-No. 0618.500-921
1	ACU6100-1-(293)	Article-No. 0617.725-921
1	ACU6100-2-(120)	Article-No. 0585.319-921
1	ACU6100-2-(130)	Article-No. 0588.921-921
1	ACU6100-2-(1300)	Article-No. 0619.310-921
1	ACU6100-2-(2300)	Article-No. 0608.106-921
1	ACU6100-2-(2310)	Article-No. 0623.083-921
1	ACU6100-2-(5200)	Article-No. 0608.114-921
1	ACU6100-2-(5300)	Article-No. 0608.122-921
1	ACU6100-2-(1305)	Article-No. 0627.631-921
1	ACU6100-2-(B300)	Article-No. 0629.723-921
1	ACU6100-2-(B305)	Article-No. 0625.681-921
1	ACU6100-1-(2325)	Article-No. 0629.588-921
1	ACU6100-1-(A330)	Article-No. 0639.176-921
1	ACU6100-1-(A350)	Article-No. 0639.494-921
1	ACU6100-2-(5305)	Article-No. 0646.687-921
1	ACU6100-1-(0325)	Article-No. 0641.219-921
1	ACU6100-1-(A340)	Article-No. 0658.901-921
1	ACU6100-2-(B310)	Article-No. 0648.851-921
1	ACU6100-2-(5313)	Article-No. 0663.735-921

1.9.2 Accessories

Qty	Connector Kit	
1	CK5102-C (crimp version) <ul style="list-style-type: none"> • 1x 10-pol. cable connector, socket, crimp • 1x 19-pol. cable connector, socket, crimp 	Article-No. 0586.889-954
1	CK5104-C (crimp version, manufacturer COMMITAL) <ul style="list-style-type: none"> • 1x 10-pol. cable connector, socket, crimp • 1x 19-pol. cable connector, socket, crimp 	Article-No. 0614.971-954

Qty	Termination Resistor	
1	Termination Resistor 121 Ω, 0.25 W	Article-No. 0717.762-323

1.9.3 Documentation

Qty	Documentation	
1	(OI) ACU6100 Operating Instructions, English	Article-No. 0590.363-071
1	(I&O) ACU6100 Installation and Operation manual, English	Article-No. 0589.845.071
1	(M&R) ACU6100 Maintenance and Repair manual, English	Article-No. 0589.853.071
1	(I&O) CSW6100-2 manual; Configuration Software for the Digital Voice Communication System DVCS6100	Article-No. 0608.939-071

2 Installation

This manual must be available during performance of all tasks.

The installation of the device(s) depends on the type of aircraft and its equipment and therefore only general information can be given in this section.

Any deviations from the instructions in this document are under own responsibility.

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2.1 Packaging, Transport, Storage

Visually inspect the package contents for signs of transport damage.

⚠ CAUTION

The packaging material is inflammable, if it is disposed of improperly by burning, toxic fumes may develop.

Keep the packaging material and use it in the case of a return shipment. Improper or faulty packaging may lead to transport damages.

Make sure to transport the device always in a safe manner and with the aid of suitable lifting equipment if necessary. Do never use the electric connections for lifting. Before the transport, a clean, level surface should be prepared to put the device on. The electric connections may not be damaged when placing the device.

First Device Checkup

- Do a check for signs of damages.
- Please make sure that the indications on the type plate agree with your purchase order.
- Make sure that the equipment is complete ("Scope of Delivery", page 26).

Storage

If you do not install the device immediately, make sure to store it in a dry and clean environment. Make sure that the device is not stored near strong heat sources and that no metal chippings can get into the device.

2.2 Device Assignment

This manual is valid for the devices:

- ACU6100 and its variant + accessories.

2.2.1 Scope of Delivery

- Manuals
 - Operating Instructions.
- Device as ordered.
- Documents of Certifications.
 - Authorized Release Certificate (EASA Form 1).

2.2.2 State of Delivery

- The device is ready for use with factory default adjustments.

2.2.3 Additional Equipment

- Gravo plates or laser plates for ACU6100
- Installation material.
- Connector kits.
- Cable harness.
- Remote Electronic Unit REU6100.
- Headset.

Details see "Accessories", page 23.

2.2.4 Type Plate

The device type is specified by the type plate (on the housing):
 Example:



Figure 5: Type plate (example)

Explanation:

PN:	<p>Type designation: ACU6100 = Single Block Audio Control Unit</p> <p>Options: -1-: Not NVIS compliant -2-: NVIS compliant (0XXX): Black panel (1XXX): Black panel, NVIS friendly (2XXX): Grey panel (3XXX): Grey panel, blue status LEDs (5XXX): Black panel, NVIS compliant (6XXX): Black panel, blue status LEDs (AXXX): Vertical black panel (BXXX): Vertical black panel, NVIS friendly, (CXXX): Vertical grey panel (X2XX): Standard panel inlay (X3XX): Blank panel inlay (X9XX): Blank panel inlay, RX only (XX0X): Dimming 0...28 V, green (XX1X): Dimming 0...5 V, green (XX2X): Dimming 0...28 V, blue white (XX3X): Dimming 0...5 V, blue white (XX4X): Dimming 0...28 V, warm white (XX5X): Dimming 0...5 V, warm white (XXX0): IC keying on panel (XXX5): Fixed wing options</p>
SN:	Unique number of the particular device
AN:	Article number
	<p>Software: Refer to the version on the device type plate</p>
	<p>Compliance and Certifications: Refer to the text and logos on the device type plate</p>

2.2.5 Software/Firmware Status – Functionality

- The software version of new deliveries is subject to change without notice.

2.3 Installation Requirements

The installation of the device(s) depends on the type of aircraft and its equipment and therefore only general information can be given in this section.

SAFETY INSTRUCTIONS

The installation of ACU6100 into an aircraft may be carried out by an authorized installation company. The country regulations always have to be obeyed.

- The device must not be opened.
- Keep enough distance to devices with integrated ventilator fans to make sure the free circulation of the cooling air.
- The installation area must have a minimum distance of 30 cm from the magnetic aircraft compass, to prevent any interference to the magnetic compass.
- Forced cooling is not required.

SAFETY INSTRUCTIONS

ACU6100 is made for installation in cockpit environment of fixed and rotary wing aircraft (depends on variant).

- The installation must be in accordance with the local aviation authority approved guidelines (e.g. EASA, FAA).
- The personnel installing this device must make sure that the aircraft installation conditions are in the ETSO/TSO standards applicable for the specified type or class of aircraft.
- The conditions and tests for ETSO/TSO approval of this article are minimum performance standards.
- The equipment is not qualified for installation in areas with fluid contamination.
- Changes or modifications made to this equipment not expressly approved in written form by Becker may void the authorization to operate this equipment.

2.3.1 ACU6100 - Gravo Plate Installation

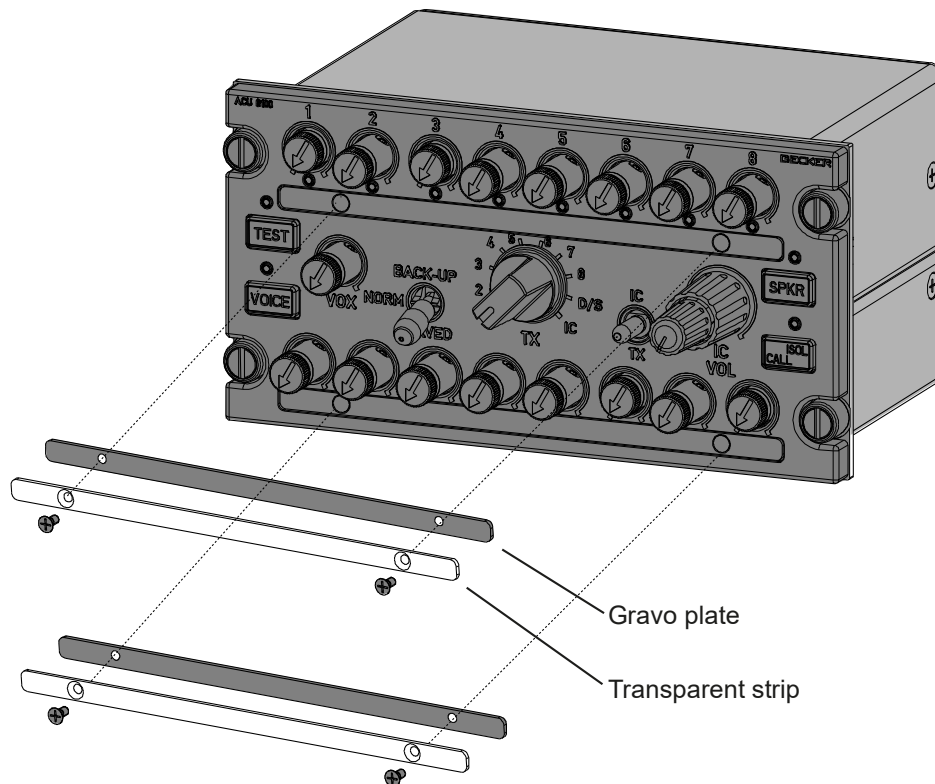


Figure 6: ACU6100 - Gravo Plate Installation

Notice:

The gravo plates which identify the function of TX and RX knobs are prepared for customer individual configuration, therefore they must be bought separate from the ACU6100.

The ACU6100 comes with installed blank plates covered by transparent plastic strips. Before installation of an ACU6100 the blank plates must be replaced by the customized gravo plates.

Procedure:

- Remove the left and right screw from each plate.
- Replace the blank plates by the customized gravo plates.
- Tighten carefully the left and right screws on both plates.
 - Note: Do not exceed a torque of 0.18 Nm.
- Each variant of the gravo plate has an individual part number for identification.
- For information of available predefined gravo plates, or new gravo plates, please contact Becker Avionics. For department and addresses, please see contact info page 2.

2.3.2 ACU6100 - Laser Plate Installation

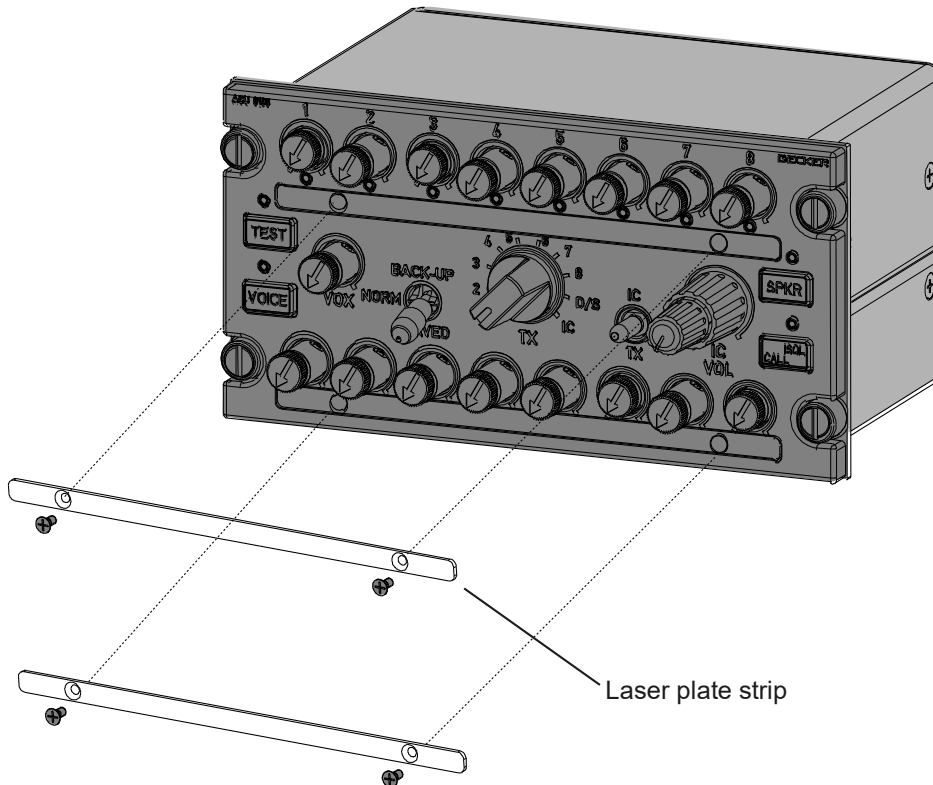


Figure 7: ACU6100 - Laser Plate Installation

Notice:

The laser plate strips which identify the function of TX and RX knobs are prepared for customer individual configuration, therefore they must be bought separate from the ACU6100.

The ACU6100 comes with installed blank label strips. Before installation of an ACU6100 the blank label strip must be replaced by the customized laser plate strips.

Procedure:

- Remove the left and right screw from each label strip.
- Replace the blank label strip by the customized label strip.
- Tighten carefully the left and right screws on both label strips.
 - Note: Do not exceed a torque of 0.18 Nm.
- Each variant of the label strip has an individual part number for identification.
- For information of available predefined label strips, or new label strips, please contact Becker Avionics. For department and addresses, please see contact info page 2.

2.4 Dimensions

2.4.1 ACU6100

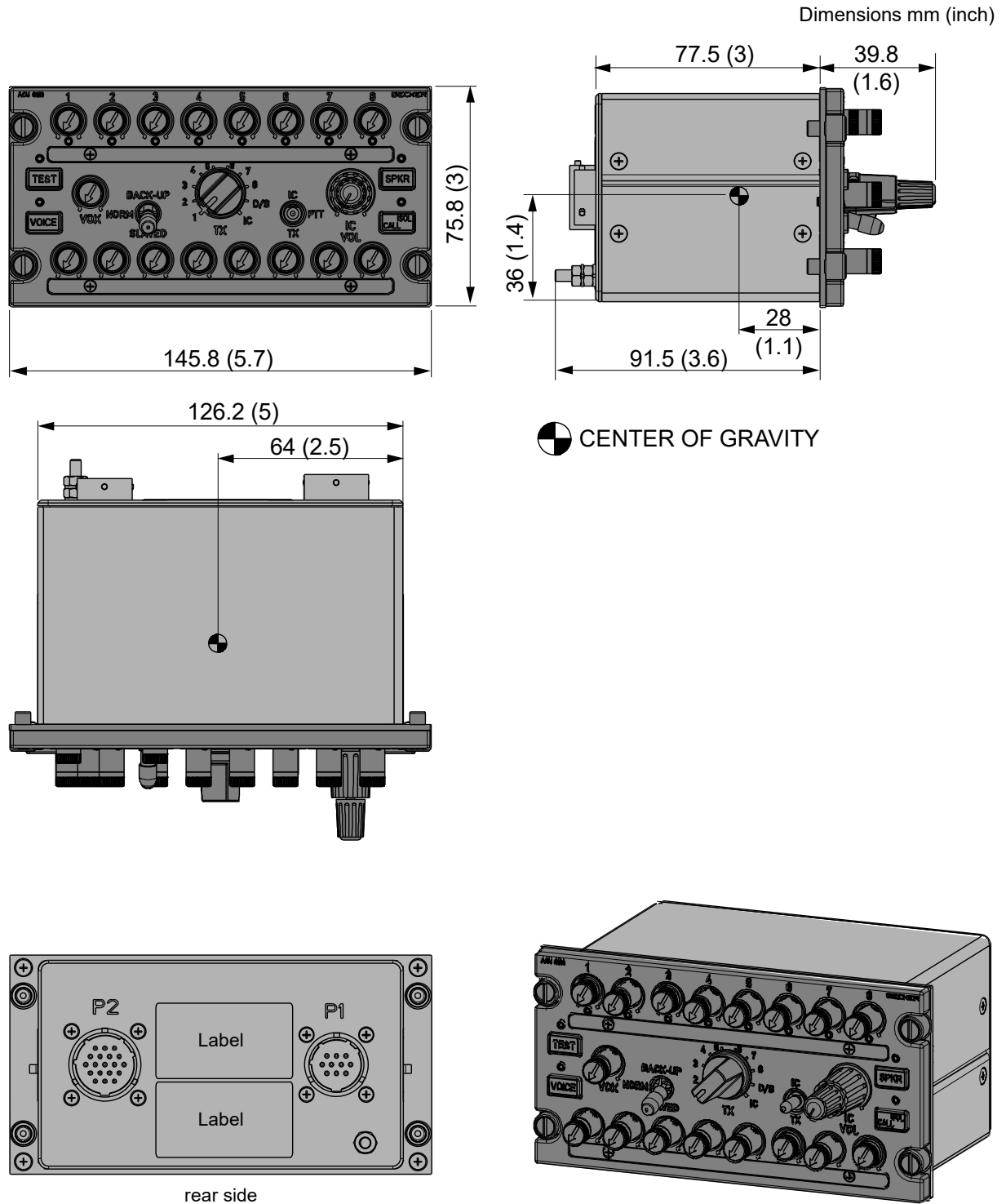


Figure 8: Dimensions ACU6100

NOTICE "Center of Gravity" for ACU6100 without other connections.
Tolerance: ± 5 mm.

Permitted deviation for dimensions without tolerances: DIN ISO 2768 T1 C (dimensions in mm)		
xx...6 (± 0.3)	>30...120 (± 0.8)	>400...1000 (± 2.0)
>6...30 (± 0.5)	>120...400 (± 1.2)	>1000...2000 (± 3.0)

2.5 Connector Pin Assignments

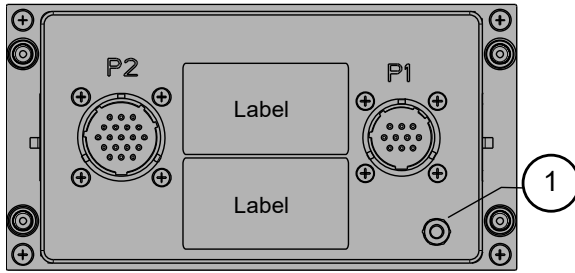
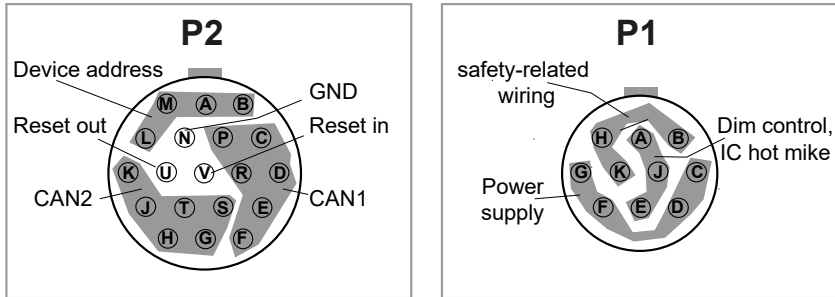


Figure 9: ACU6100 – connector layout

P1: 10pol male, bayonet
 P2: 19pol male, bayonet

①: Grounding bolt



2.5.1 Connector P1

P1/Pin	Signal name / Function	Remarks
C	DC1	+27.5 V
D	GND1	
G	DC2	+27.5 V
F	GND2	
H	PTT in/out	
B	Back-Up (Emergency) Switch out	
K	Slaved Switch out Mask-Mike Switch out	ACU6100-X-(XXX0) ACU6100-X-(XXX5)
J	IC Hot Mike in	Intercom activation line (low active)
E	Dim Control1 in	Panel illumination
A	Dim Control2 in	Brightness of LED's

2.5.2 Connector P2

P2/Pin	Signal name / Function	Remarks
L	Device Address Bit 0	
M	Device Address Bit 1	
A	Device Address Bit 2	
B	Device Address Bit 3	
U	Reset out	
V	Reset in	
N	GND	
C	CAN1 in (HI)	
D	CAN1 in (LO)	
P	CAN1 in (shield)	
E	CAN1 out (HI)	
F	CAN1 out (LO)	
R	CAN1 out (shield)	
G	CAN2 in (HI)	
H	CAN2 in (LO)	
S	CAN2 in (shield)	
J	CAN2 out (HI)	
K	CAN2 out (LO)	
T	CAN2 out (shield)	

2.5.3 Address Coding

- Set the address coding for the control panels (ACU) on the CANbus by pin strapping of pins L, M, A, B.
- For each control panel on the CANbus a unique address is necessary.

2.6 Aircraft Wiring

**SAFETY
INSTRUCTIONS**

The installation of the device(s) depends on the type of aircraft and its equipment and therefore only general information can be given in this section.

**SAFETY
INSTRUCTIONS**

- Use only cables which are qualified for aircraft use (self-extinguishing).
- Use AWG 20 for power supply and AWG 24 for other cables.
- Interface lines TX-A/TX-B and RX-A/RX-B are each to be laid as 2-core twisted and shielded cables.
- Attach sleeves over the solder joints on the equipment connector.
- HF cable should not be included in the cable harnesses.
- Use the recommended fuses in the power supply line for the protection of the application, see "Technical Data", page 19.

⚠ CAUTION

- Examine the wiring carefully before power up the device(s) and examine particularly correct connection of the power supply lines.

2.6.1 Electrical Bonding and Grounding

The ACU6100 has a threaded grounding bolt at the housing. Use this point as grounding contact.

**SAFETY
INSTRUCTIONS**

- Make sure that the device is correctly connected to aircraft ground (structure).
- Make sure that the electrical bonding area is protected in order to prevent corrosion.
- Make sure that the resistance between the bonding component and any point of this item of equipment do not exceed 2.5 mΩ.

2.6.2 ACU6100 - Power Supply Connections

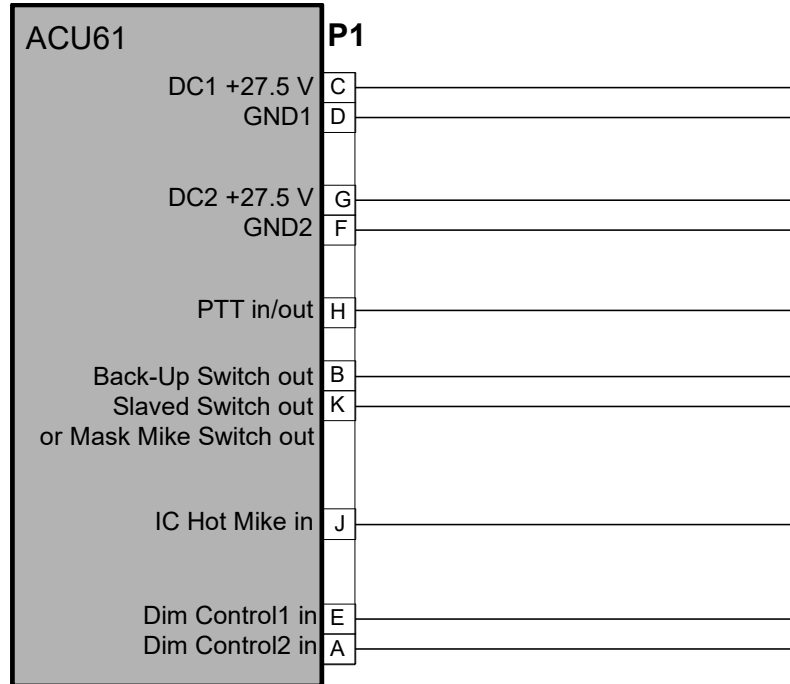


Figure 10: Wiring - Power Supply

2.6.3 ACU6100 - CANbus and Device Address

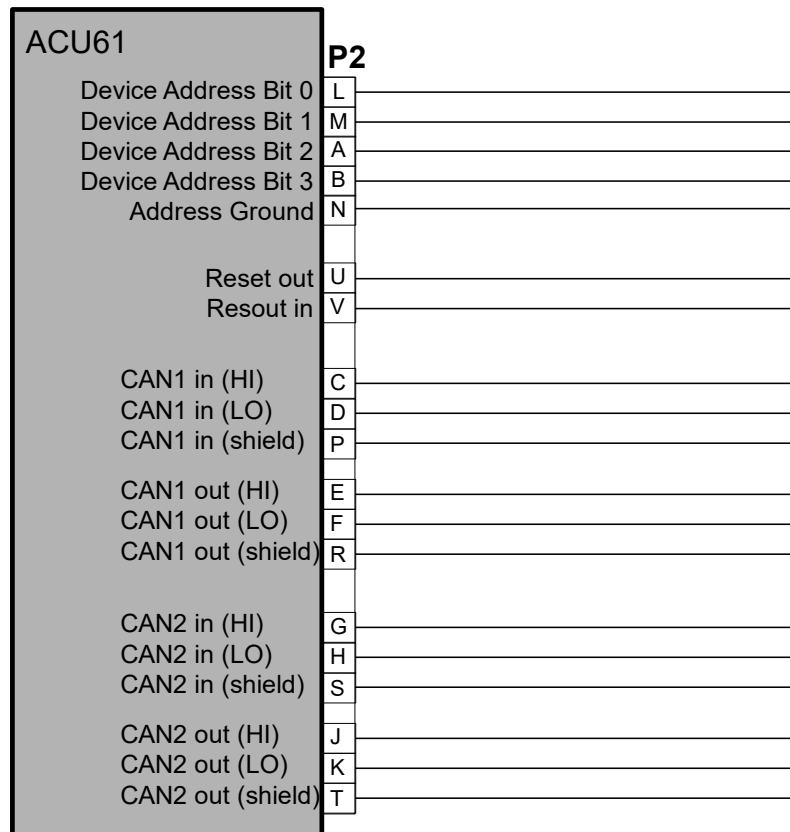


Figure 11: Wiring - Device Address, CANbus

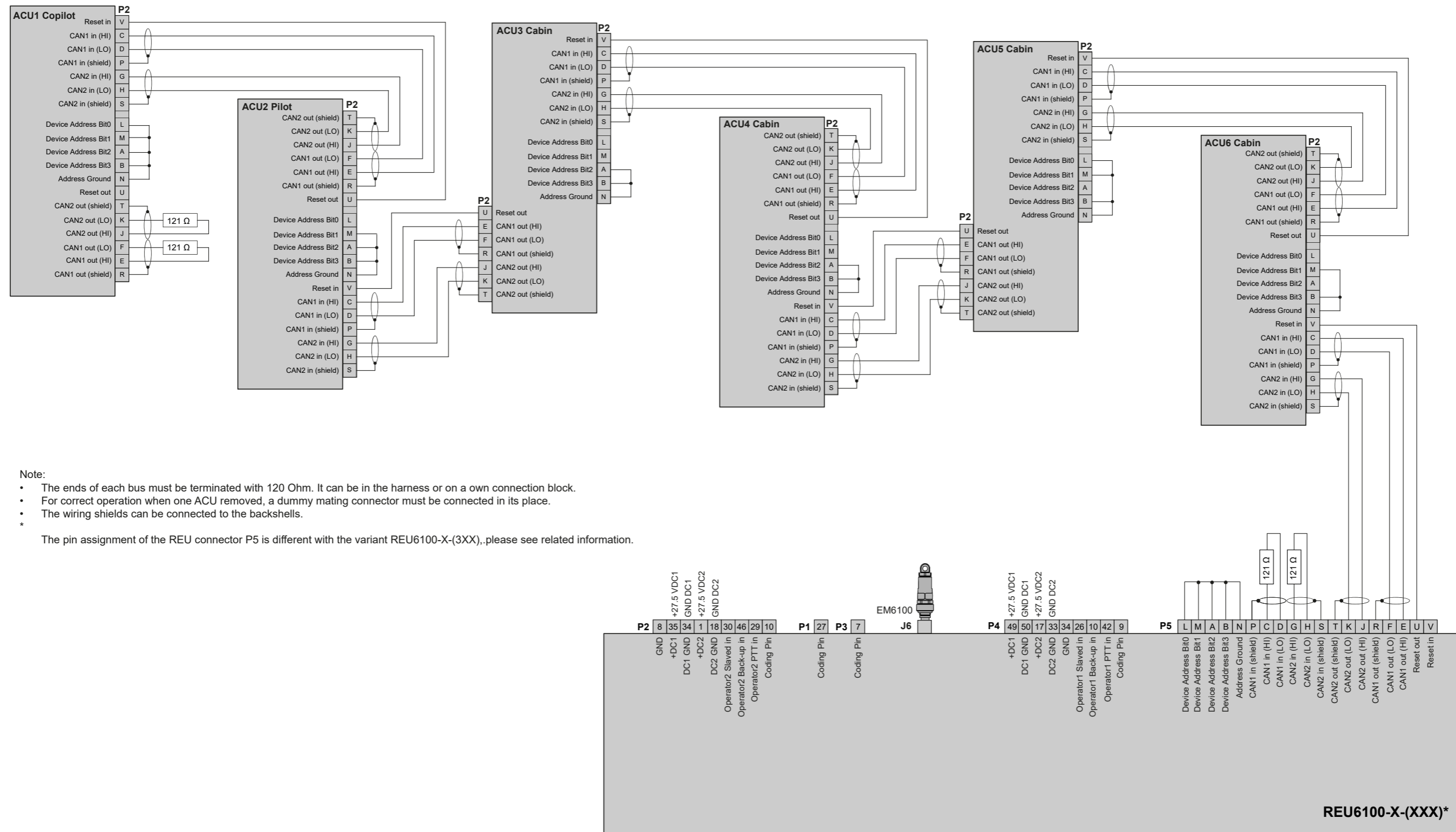
The control panels (ACUs) are connected via two CANbus links (CAN1, CAN2).
When one CANbus fails, the devices automatically switch to the remaining connection.

Notice:

The ends of each bus must be terminated with 120 Ohm. It can be in the harness or on a own connection block.

For correct operation when one ACU removed, a dummy mating connector must be connected in its place.

2.6.4 Wiring - 6x ACU6100, CANbus and Device Address



Note:

- The ends of each bus must be terminated with 120 Ohm. It can be in the harness or on a own connection block.
- For correct operation when one ACU removed, a dummy mating connector must be connected in its place.
- The wiring shields can be connected to the backshells.

* The pin assignment of the REU connector P5 is different with the variant REU6100-X-(3XX),.please see related information.

Figure 12: Wiring - 6x ACU6100, CANbus and Device Address

For detailed wiring information refer to the REU6100 manual:

www.becker-avionics.com/downloads/ → Intercom → Digital Voice Communication System DVCS6100 → REU6100 Installation&Operation Manual (Article No. 0589.829-071).

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2.7 Configuration

The configuration of the DVCS6100 can be changed and edited by using a personal computer or laptop with the related software CSW6100.

2.8 Functions

2.8.1 Intercom Circuits

It is possible that some users (ACU devices) are connected to a group(s) = intercom circuit(s). The user and group selection are done in the configuration.

Intercom circuit (intercom groups):

- Cockpit crew.
- Cabin crew.
- IC ring line (connected to the cabin, cockpit or 3rd-IC-circuit; configurable by the configuration setup*).
- 3rd-IC-circuit (controlled by an external switch, refer to the REU6100 manual).

2.8.2 Example: Intercom Extension for Passengers

- With an additional intercom amplifier (e.g. Becker IC3100) passengers can be connected with the intercom system.
- These passengers are connected with the cabin intercom circuit of the DVCS6100 system.
- It can be disconnected (isolated) by an external switch which is not shown in the diagram.

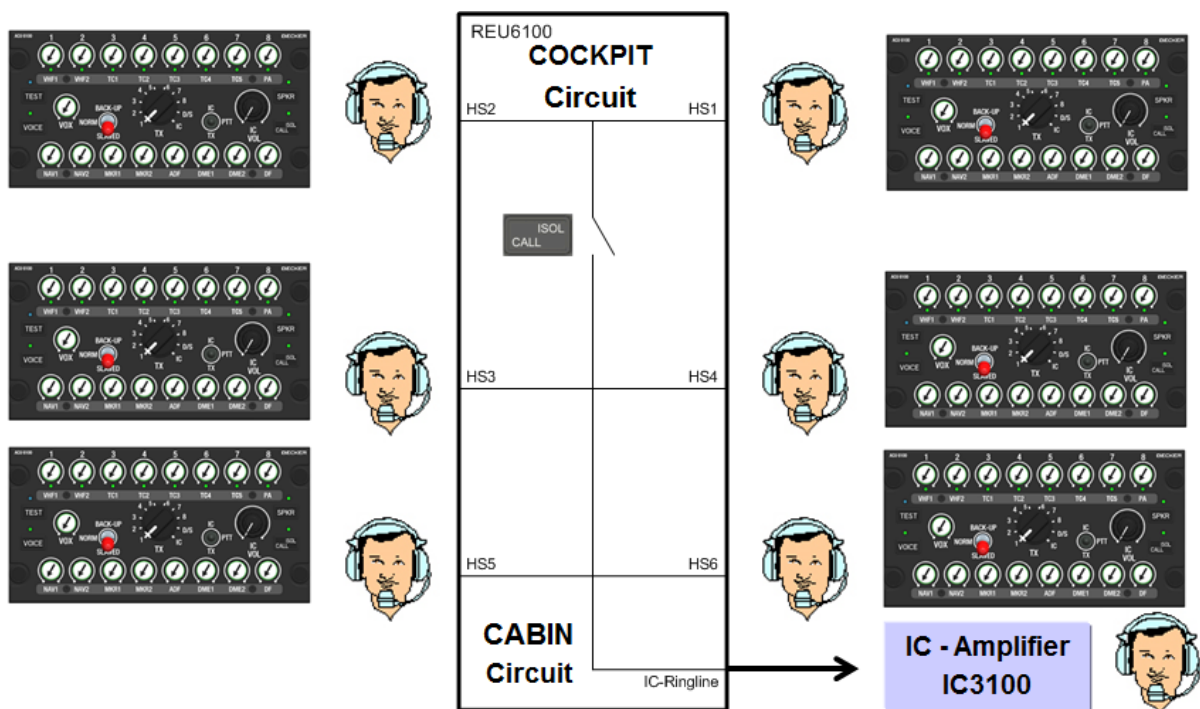


Figure 13: Operation - Intercom Extension for Passengers

Selective Call

2.8.3 Example: Intercom Extension for Ground Crew

- With an additional ground crew box (e.g. Becker EB3100) ground crew can be connected with the intercom system.
- That ground crew is connected with the cockpit intercom circuit of the DVCS6100 system.

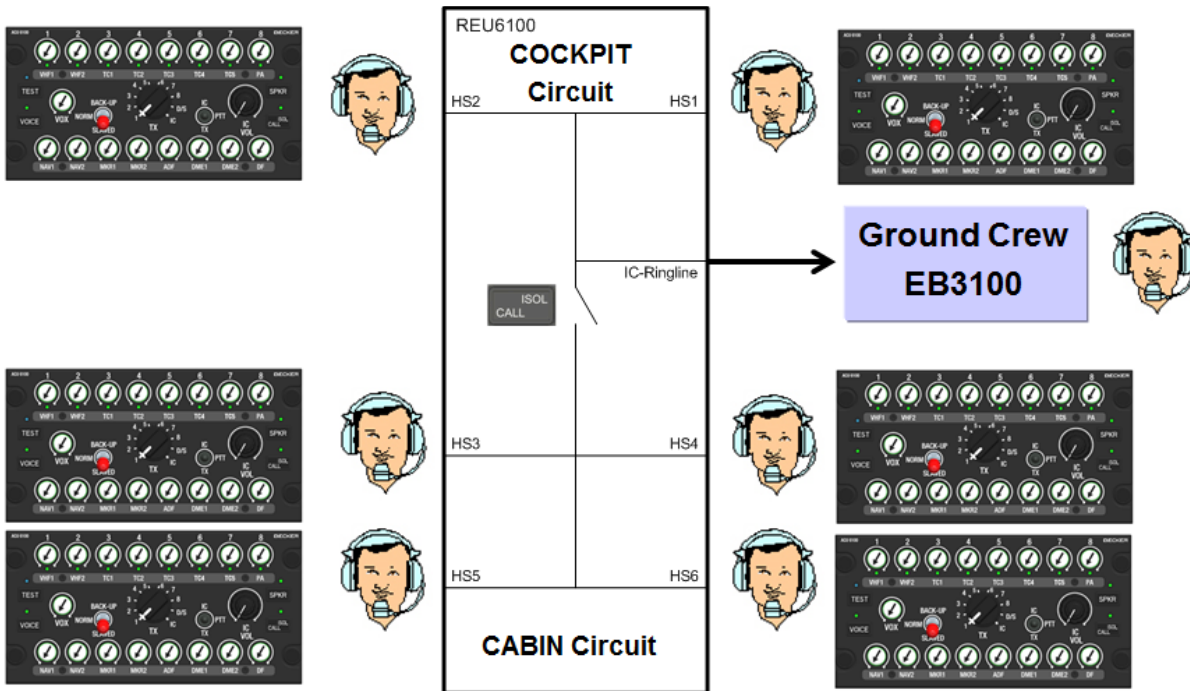


Figure 14: Operation - Intercom Extension for Ground Crew

2.8.4 Emergency Call (E-Call)

A call for connection can be a "Call" or an "Emergency Call" (E-Call).

To send an E-Call, an external emergency switch is necessary.

- An E-Call tone different to the "Call" tone is audible in the cockpit (depends on configuration).

NOTICE:

- To send an E-Call, an external emergency switch is necessary.
- The wiring is done through a discrete input.
- The function and settings depend on configuration.

2.9 Selective Call

The function "Selective Call" and forced monitoring for "Selective Call" can be set to one of the eight TX-channels (configuration).

NOTICE:

- The wiring is done through a discrete input.
- The function and settings depend on configuration.

2.10 Post Installation Check

After the device/system is installed completely do a test. Make sure that the compliance with the authority required procedures is obeyed.

The description that follows gives guidance for such tests.

2.10.1 Mechanical Installation and Wiring Check

- Make sure that all cables are attached and the shields are connected to ground.
- Examine the movement of controls to make sure that there is no interference.
- Make sure that all screws are tight and the connectors of the device are secured.

2.10.2 Power Supply

- Examine the power supply lines and the correct polarity.
- Make sure that the power supply is in the specified limits, with and without an engine that is in operation.

2.10.3 Power On Check

- For ACU6100 devices refer to the operation section of the ACU610X manual for specific operational details "Operation" page 43.

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3 Operation

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3.1 General

This section contains general information and instructions for safe operation.

NOTICE

- Some functions are only available when they are enabled for the user in the configuration software*.
- The scope of functions is variant-dependent.

* Details available at Becker Avionics.

3.2 Device Description

The Audio Control Unit is part of the Digital Voice Communication System DVCS 6100.

It is for the control of the Remote Electronic Unit REU6100. Together with the Remote Electronic Unit REU6100 it is the intercom system of the aircraft.

- A maximum of six audio control devices can be connected to a Remote Electronic Unit REU6100.

For a list of associated devices please see "Associated Devices" page 15 .

3.2.1 Device Assignment

This manual is valid for the devices:

- ACU6100 and its variant + accessories.

3.2.2 Packing, Transport, Storage

- See page 25

3.2.3 Scope of Delivery

- See page 26

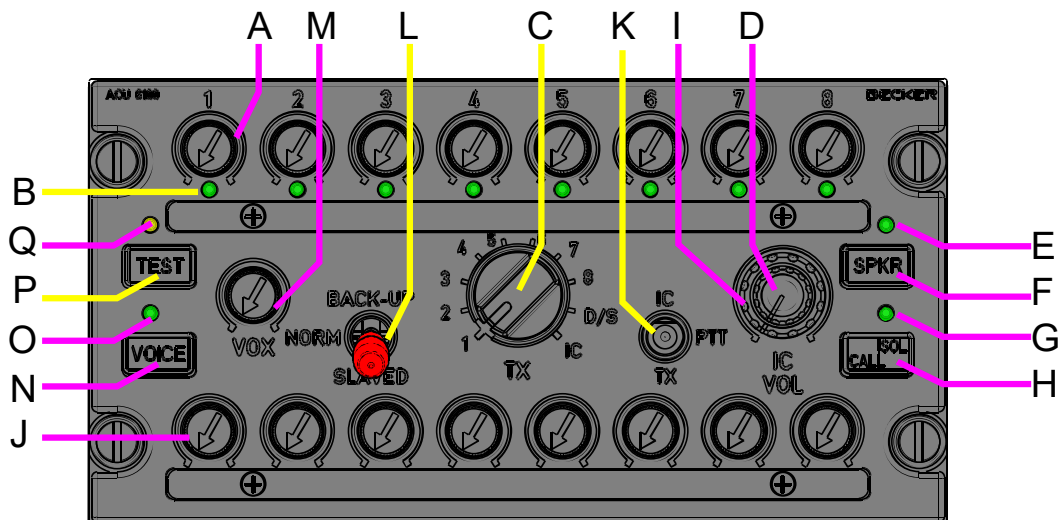
3.2.4 State of Delivery

- See page 26

3.2.5 Type Plate

- See page 27

3.2.6 Controls and Indications



design depends on variant


Figure 15: ACU6100 - User Interface



	Description	Main Function
A	TX1...TX8 8 push knobs with potentiometer function	On/off for each TX-channel and individual channel volume control.
B	depends on variant TX1...TX8 LEDs 8 status LEDs (green)	Indication of TX channel status. LED on: Channel is selected for transmission. LED flashes: On the channel is transmitted. LED flashes fast: Selective Call is active.
C	depends on variant TX-selector Rotary switch (10 positions)	Position 1...8: TX-channel selection for transmission. Position D, (D/S): Selection of 2 TX channels for dual transmission mode. Position D, (D/S): Selection of multi transmit mode (configuration). Position IC: Intercom PTT mode.
D	Double rotary knob Inner rotary knob	Volume control for intercom.
E	SPKR LED Speaker status LED (green)	LED on: Speaker is on. LED off: Speaker is off.
F	SPKR Key	Set the speaker on/off for audio monitoring.
G	"ISOL/CALL" LED Status LED (green)	LED on: Cockpit and cabin intercom circuits are isolated. LED off: Cockpit and cabin intercom circuits are connected. LED flashes: Request "CALL" is active.
H	"ISOL/CALL" Key	Used to control the intercom functions between cockpit and cabin. The cockpit device can isolate and connect the cabin circuit. The cabin device can start a "CALL" for connection.
I	Double rotary knob Outer rotary knob	Main volume control.
J	RX1...RX8 8 push knobs with potentiometer function	On/off for each RX-channel and individual channel volume control.
K	depends on variant PTT Toggle switch (2 positions set momentarily) PTT/IC (optional) Toggle switch (2 positions set momentary) MASK/MIC (optional) Toggle switch (2 locking positions)	PTT selected: Transmitter is selected for transmission. PTT released: The selected channels are monitored. IC selected: Start of the IC operation. External relay control for MASK/MIC switch over.
L	depends on variant	

Device Description

	Description	Main Function
	<p>BACK-UP Toggle switch (3 locking positions) or Toggle switch (2 locking positions)</p>	<p>Used for the selection of the operation mode: BACK-UP: Emergency operation. NORM: Normal operation. SLAVED: Slaved operation. BACK-UP: Emergency operation. NORM: Normal operation.</p>
M	<p>VOX Push knob</p>	<p>Used to set VOX function on/off and to set the individual VOX threshold level.</p>
N	<p>VOICE key</p>	<p>Used to set the ident filter on/off for the configured RX-channels.</p>
O	<p>VOICE LED Status LED (green)</p>	<p>LED on: Voice filter is started. LED off: Voice filter is off.</p>
P	<p>depends on variant TEST Key or MKR MUTE Key</p>	<p>Used to start the IBIT. Used to start the marker mute function.</p>
Q	<p>Test LED Status LED (yellow)</p>	<p>LED on: Self-test in progress. LED flashes: An error was found.</p>

3.2.6.1 Control Elements

	Push knobs:
 <p>released - locked</p>	<p>Push knobs</p> <ul style="list-style-type: none"> • A knob/channel is released when it is in the upper position and can be turned. <ul style="list-style-type: none"> ○ The knob is illuminated. • The knob/channel is out of function when it is in the lower position. • An arrow on top of each knob helps the user to adjust the volume of the channels.

Toggle switch:	
<p>BACK-UP NORM  SLAVED</p> <p>(depends on variant)</p>	<p>Toggle switch with lock positions</p> <ul style="list-style-type: none"> • Pull switch to unlock the position. • Select the position manual between normal operation, back-up operation and slaved operation. <p>CAUTION:</p> <ul style="list-style-type: none"> • In back-up operation (emergency), only a subset of the functionality is available, see "Emergency Operation" page 60.
<p>IC  PTT TX</p> <p>(depends on variant)</p>	<p>Toggle switch without lock positions</p> <ul style="list-style-type: none"> • Push and hold the switch to the related position.

3.3 Start-Up

SAFETY INSTRUCTIONS

Excessive pulses on the DC bus of the aircraft may cause damage on electrical circuits of any installed instrument.

Do not switch ON the device during engine start or shutdown

- The ACU6100 powers up with the main system power.
- The test routine will be started (test time ca. 4 s)
 - The test status LED (yellow) is on.
 - The internal circuits and the data transfer between ACU61 and REU6100 will be examined.
- After successful test without failure the test status LED is off.
- If a failure was found the test status LED (yellow) flashes.

There are two procedure to continue, if a failure was found:

- (1) Push at the "TEST" button the failure will be ignored.
 - If there is permanent problem inside the system, it will be found by the continuous self-test routine and indicated again.
- (2) Set the "BACK-UP" switch to slaved or emergency mode (details see "Emergency Operation" page 60).

NOTICE

- Some functions are only available when they are enabled for the user in the configuration software*.
- The scope of functions is variant-dependent.

*For more information refer to the software manual "CSW6100..."(www.becker-avionics.com/downloads/ → Intercom).

3.4 Volume Adjustment

3.4.1 Main Volume Adjustment

Main Volume Adjustment

- The main volume is adjustable at any time.
- Turn the outer part of the double rotary knob (VOL) to adjust the volume.
 - The main volume adjustment is for all audio channels which are on and the fixed inputs 4...6.

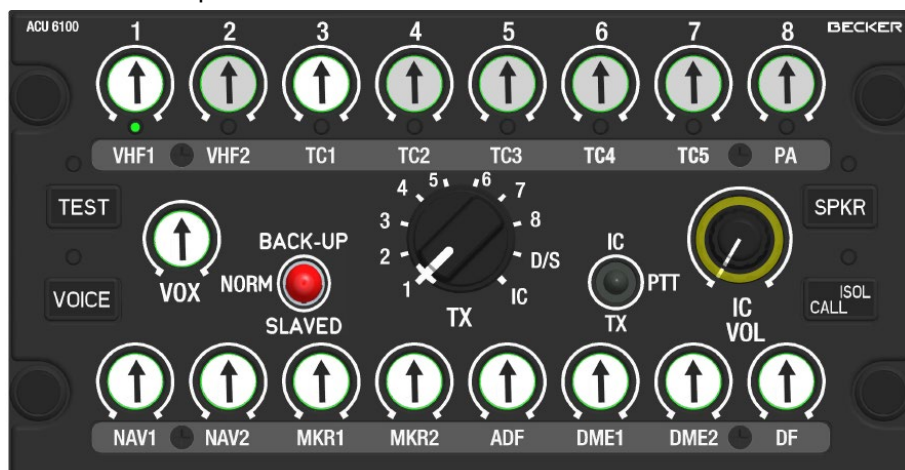


Figure 16: Operation - Main Volume

3.4.2 IC Volume Adjustment

IC Volume Adjustment

- The IC volume is adjustable at any time.
- Turn the inner part of the double rotary knob (IC) to adjust the volume.

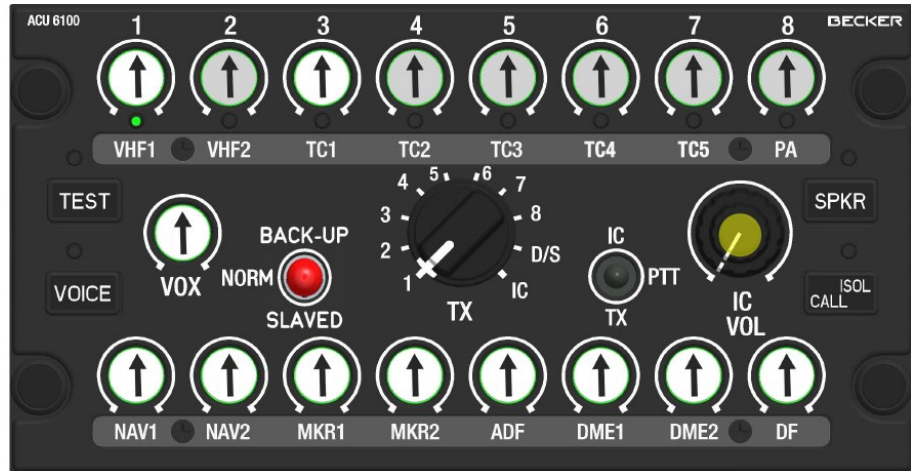


Figure 17: Operation - Main Volume

3.4.3 Channel Volume Adjustment

Channel Volume Adjustment

- It is possible to do the volume adjustment for each audio channel.
- Release the related channel (push knobs).
- Turn the knob to adjust the related volume.

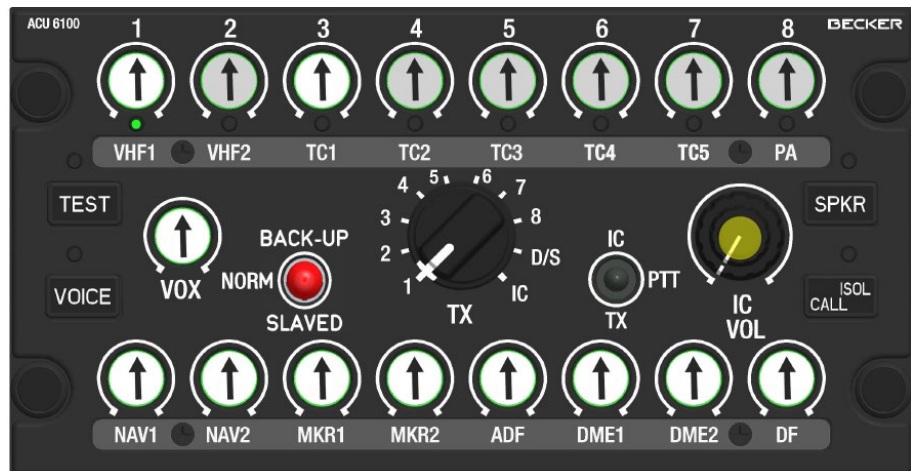


Figure 18: Operation - Main Volume

3.5 Channel Monitoring



Channel Monitoring

- Push and release the related channel knob (TX1...TX8, RX1...RX8).
 - The knob is in the upper position, can be turned, is illuminated.
 - The channel is monitored.
- Use the related knob to adjust the volume.

NOTICE:

- More than one channel can be monitored at the same time.

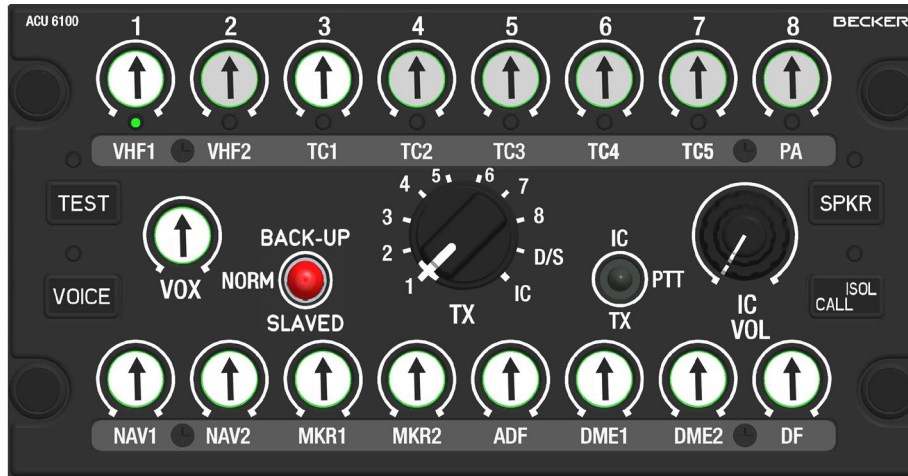


Figure 19: Operation - Channel Monitoring

3.5.1 Forced Monitoring

Forced Monitoring

The channels must be enabled for this function in the configuration.

- The reception signal of the radio which is selected for transmission with the TX selector is monitored, even if the channel is not released for monitoring (knob is in the lower position).
- Use the related knob to adjust the volume.

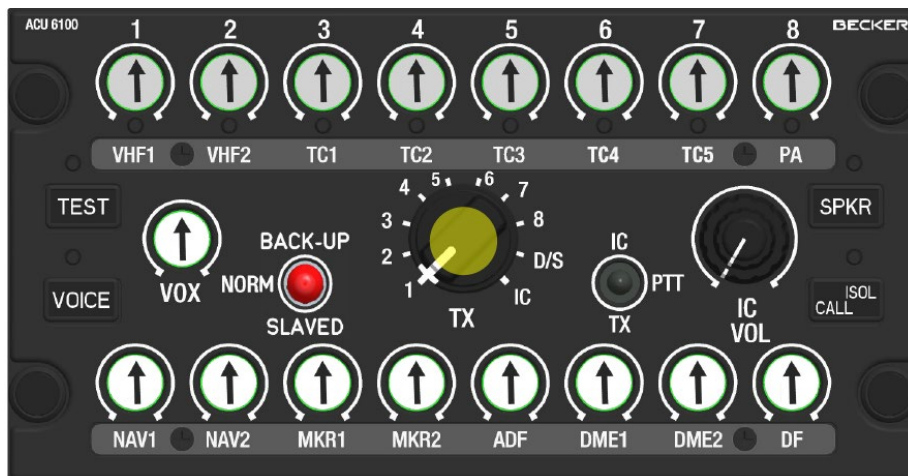


Figure 20: Operation - Forced Monitoring for TX1

3.6 Transceiver Operation

3.6.1 TX-Channel Selection



TX-Channel Selection

The channels must be enabled for this function in the configuration.

- Select the channel for transmission with the TX-selector.
 - The TX-channel LED is on.

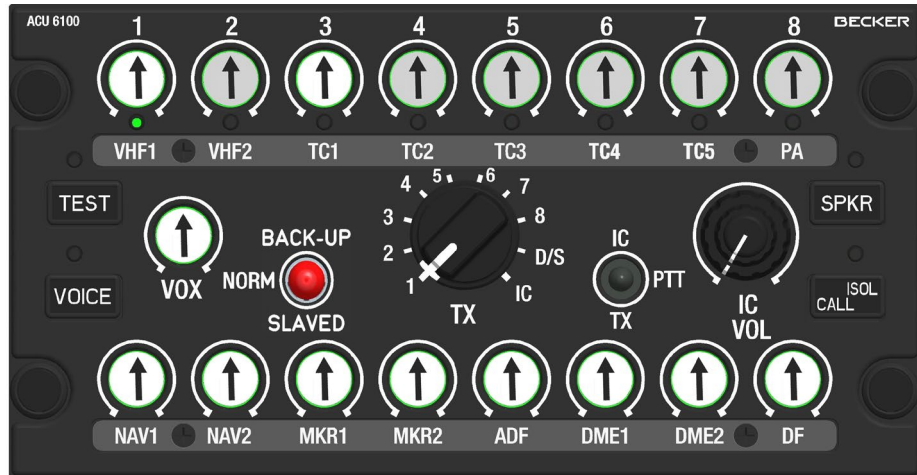


Figure 21: Operation - TX-Channel Selection, TX1

3.6.2 Dual- and Multi Transmission Mode (Simulcast)

Dual- and Multi Transmission Mode (Simulcast)

The channels must be enabled for this function in the configuration.

Used for transmission on more than one channel at the same time.

- Select the mode D (D/S) for transmission with the TX-selector.
 - The TX-channel LEDs are on.

NOTICE:

- The selection includes only TX-channels which are configured* to the user and with enabled rights (TX, Dual, Multi-TX).

*For more information refer to the software manual "CSW6100..." (www.becker-avionics.com/downloads/ → Intercom).

3.6.3 Relay Mode

Relay Mode

The ACU6100 can operate in relay mode alternative to dual TX- and multi-TX-mode. The channels must be enabled for this function in the configuration*.

The function is used to:

- Increase the communication range.
- Connect operators of different radio areas/services.

Relay Mode

NOTICE:

- Only one user can be selected as a relay operator (configuration*).
- Only two TX-channels can be in relay mode.
 - When on one TX-channel a signal is received automatically the other TX-channel is in transmit mode.

*For more information refer to the software manual "CSW6100..."(www.becker-avionics.com/downloads/ → Intercom).

Start relay operation:

Configuration mode 1, free TX-channel selection:

- Select the mode D (D/S).
- Push and release two TX-channel knobs for relay operation (only two released knobs permitted).
 - The knobs are in the upper position, can be turned, are illuminated.
 - The TX-channel LEDs are on.
 - The channels are monitored and in relay operation.
- The other TX-channel knobs must be pushed and locked, lower position.

Configuration mode 2, configured TX-channels only:

- Select the mode D (D/S).
- Push and release the two TX-channel knobs for relay operation where the LED is on after the related knob is released (only two released knobs permitted).
 - The knobs are in the upper position, can be turned, are illuminated.
 - The TX-channel LEDs are on.
 - The channels are monitored and in relay operation.
- The position of the other TX-channel knobs is not important.

During relay operation:

- All TX-channels can be used from other users when no signal is received. The relay mode has priority when a signal is received.
- The relay operator can communicate with other intercom members.

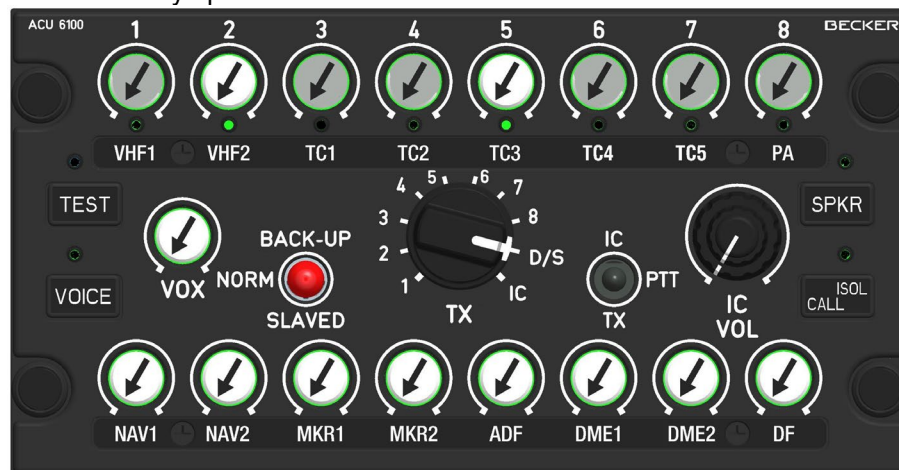


Figure 22: Operation -Relay Mode

3.6.4 Transmission on TX-Channels

Transmission on TX-Channels

- Push and hold the PTT switch (on panel or external) on TX position to start the transmission mode.
 - The LED of the related channel knob flashes.
- If a TX-channel LED flashes before the transmission has started then the channel is already taken for transmission (PTT) by another user.

During transmission:

- The related TX-channel LED flashes for all users which have this channel on the display.
- The related TX-channel LED flashes while a user transmits.
- In dual- or multi TX-mode, all selected TX-channel LEDs flash while the user transmits.
- During transmission, all received signals, are muted (depends on configuration*).
- Only warning tones which have been programmed as essential are audible during transmission (depends on configuration*).
- If a loudspeaker is connected it will be muted to prevent acoustic feedback to the microphone.
- A sidetone is audible the volume is adjusted in the installation setup.

After PTT release:

- The transceiver turns back to receive mode.
- The related channel LED is on.
- All previously selected signals, intercom and warning tones are continued.
- If the loudspeaker was muted, it is on again.

*For more information refer to the software manual "CSW6100..." (www.becker-avionics.com/downloads/ → Intercom).

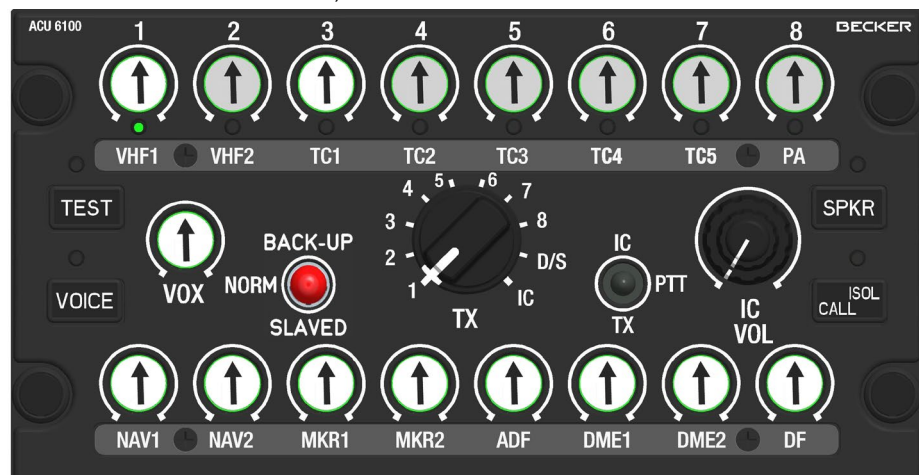


Figure 23: Operation - Transmission on TX1

3.7 Intercommunication between Users



ISOL/CALL key

Isolated / Call Function

It is possible that some users (ACU devices) are connected to a group(s) = intercom circuit(s). The user and group selection are done in the configuration.

Intercom circuit (intercom groups):

- Cockpit crew.
- Cabin crew.
- IC ring line (connected to the cabin, cockpit or 3rd-IC-circuit; configurable by the configuration setup*).
- 3rd-IC-circuit (controlled by an external switch, refer to the REU6100 manual).

Functions:

- The cockpit and cabin intercom circuits can be directly controlled by the ACU610X.
- All users in the same intercom circuit are able to listen and talk together.
- The intercom circuit can be isolated and connected.
- If two intercom circuits are connected, all users of this two intercom circuits can hear and talk to each other.
- If two intercom circuits are isolated, users of the one intercom circuit cannot hear or talk to a user of the other intercom circuit.

Isolate/connect intercom circuit:

- Push to the key "ISOL/CALL".
 - The intercom between the cockpit and cabin circuit is disconnected (isolated).
 - The LED "ISOL/CALL" is on.

3.7.1 Isolated / Call Function - Cockpit



ISOL/CALL key

Isolated / Call Function - Cockpit

In the cockpit the key "ISOL/CALL" is used to connect/disconnect the cockpit and the cabin circuit.

- Push to the key "ISOL/CALL".
 - The intercom between the cockpit and cabin group is disconnected (isolated).
 - The LED "ISOL/CALL" is on.

NOTICE:

- LED on: cockpit and cabin intercom circuits are disconnected (isolated).
- LED off: cockpit and cabin intercom circuits are connected.

3.7.2 Isolated / Call Function - Cabin



ISOL/CALL key

Isolated / Call Function - Cabin

In the cabin the key "ISOL/CALL" is used to send a - call for connection - to the cockpit circuit if the intercom circuits are disconnected (isolated).

- Push to the key "ISOL/CALL".
 - A call for connection is sent to the cockpit circuit.
 - The LED "ISOL/CALL" flashes.
- A member of the cockpit circuit can accept the call and can connect the cabin circuit with a push to the key "ISOL/CALL".

NOTICE:

- LED on:
 - Cockpit and cabin intercom circuits are disconnected (isolated).
- LED off:
 - Cockpit and cabin intercom circuits are connected.
- LED flashes:
 - A call was sent.
 - The system is in call mode.
 - A call tone is audible in the cockpit (depends on configuration).
- If the intercom circuits are connected, the key "ISOL/CALL" on the cabin devices have no function.

NOTICE

For some special mission profiles also the cabin circuit members must be able to disconnect the cockpit and the cabin circuit (depends on configuration).

- The cabin circuit members can only disconnect the intercom circuits.
- Only a cockpit circuit member can connect the circuits.

3.7.3 Emergency Call (E-Call)

A call for connection can be a "Call" or an "Emergency Call" (E-Call).

To send an E-Call, an external emergency switch is necessary.

- Push the external E-Call key.
- The "ISOL/CALL" LED flashes with the double frequency of the "Call" notification.
- An E-Call tone, different to the "Call" tone is audible in the cockpit (depends on configuration).

3.8 Intercom Operation Mode

Ways to start the intercommunication between the users:

- Voice controlled (VOX).
- Intercom with PTT-IC (on rotary wing panel).
- External PTT switch controlled.

3.8.1 Intercom Operation with Voice Controlled Intercom (VOX)

- VOX is for intercommunication in the connected IC circuits.
- VOX is active when no radio transmission happens.
- VOX is disabled automatically if the loudspeaker is on.

Intercom Operation with Voice Controlled Intercom (VOX)



TX-selector

- Turn the TX-selector to a position 1...8 or to D (D/S).
- Push and release the VOX knob.
 - The knob is in the upper position, can be turned, is illuminated.
 - VOX mode is on.
- Turn the VOX knob to adjusted the VOX level of the related microphones.



VOX knob

NOTICE:

- The function for VOX on/off can be set in the configuration.
 - VOX knob released: VOX mode is on.
 - VOX knob pushed: VOX mode is off.

NOTICE

- The transmission mode always has a higher priority than the intercommunication mode.
If a user starts the transmission mode for any transceiver, the ACU stops its VOX or HOT MIKE mode and changes to transmission mode. Other devices in the circuits are not affected and their operators can continue intercommunication.

3.8.2 Intercom Operation with PTT-IC Switch

- Intercom operation with PTT-IC is for intercommunication in the connected IC circuits.

Intercom Operation with PTT-IC Switch



TX-selector

(depends on variant)

- Turn the TX-selector to a position IC.
- Push and hold the PTT switch to IC.
 - Intercom operation is on.

Notice:

- PTT switch position PTT-IC: "Hot Mike Mode" that means the mike line is open and the signal is forwarded directly to the intercom circuits.
- PTT switch position PTT-TX: Is used to set the transmitter in transmit mode.



PTT switch

(depends on variant)

NOTICE

- The transmission mode always has a higher priority than the intercommunication mode.
If a user starts the transmission mode for any transceiver, the ACU stops its VOX or HOT MIKE mode and changes to transmission mode. Other devices in the circuits are not affected and their operators can continue intercommunication.

3.8.3 Intercom Operation with External PTT Switch or ACU PPT Switch

- Intercom operation with external PTT switch is for intercommunication in the connected IC circuits.
- It is possible to connect an external PTT switch or 2-state switch to each ACU to start a "Hot Mike" mode.

Intercom Operation with External PTT Switch



TX-selector

- Turn the TX-selector to a position IC.
- Push and hold the external PTT switch or the ACU panel PTT switch.
 - Intercom operation is on.

NOTICE

- The transmission mode always has a higher priority than the intercommunication mode.
If a user starts the transmission mode for any transceiver, the ACU stops its VOX or HOT MIKE mode and changes to transmission mode. Other devices in the circuits are not affected and their operators can continue intercommunication.

3.9 Winchman Operation

The winchman function includes VOX-level and volume-level adjustments without access to a control device.

- The winchman functionality can be given to any ACU610X or headset (without installed ACU610X) by the configuration setup.
- With two external push buttons the VOX-level and volume-level can be remotely controlled by the winchman operator.
 - Push one of the two external push buttons and the winchman function will be started.
 - This enables the winchman to increase the VOX-level and the volume-level for his headset.
- • VOX-level adjustment:
 - Push the VOX-level button for a short time ($0.3 \dots \leq 3$ s), the VOX-level is increased until the maximum value is reached.
 - Push the button ≥ 3 s, the VOX-level is reset to the value selected on the related ACU panel.
 - The VOX-level is reset too, when the winchman function is set to off and the volume control or VOX control on the ACU is changed
- • Volume level adjustment:
 - Push the volume level button for a short time ($0.3 \dots \leq 3$ s), the volume level is increased until the maximum value is reached.
 - Push the button ≥ 3 s, the volume level is reset to the value selected on the related ACU panel.
 - The volume level is reset too, when the main volume control or VOX control on the related ACU is changed.

3.10 Selective Call



Selective Call

The function "Selective Call" can be set to one of the eight TX-channels (configuration).

Function:

- A selective call signal is received.
 - The TX-channel LED flashes with the double frequency of the "Call" notification.
- Push and release the related channel knob.
 - The knob is in the upper position, can be turned, is illuminated.
 - The operator can hear the incoming message.

Function when forced monitoring for the selective call channel is set:

- A selective call signal is received.
 - The TX-channel LED flashes with the double frequency of the "Call" notification.
 - The TX-channel is monitored during the selective call is present.
 - The operator can hear the incoming message without any selection.

3.11 Voice Filter (Ident Tone Suppression)

VOICE

Voice key

Voice Filter (Ident Tone Suppression)

It is possible to start a 1020 Hz notch filter for all RX-channels to suppress identification tone in the incoming audio signals. A channel must be enabled for this function in the configuration*.

- Push to the key "VOICE".
 - The related LED is on.
 - The voice filter suppresses the ident tone in the preconfigured audio channels.
- The key "VOICE" has no function if there is no channel enabled for this function in the configuration.

NOTICE:

- The default state for voice filter on/off/last state can be set in the configuration.

*For more information refer to the software manual "CSW6100... "(www.becker-avionics.com/downloads/ → Intercom).

3.12 Marker Mute



Marker Mute key
(depends on variant)

Marker Mute (depends on variant)

The marker mute function can be used for all RX-channels connected to a user. A channel must be enabled for this function in the configuration*.

- Push to the related key "MKR MUTE".
 - The preconfigured marker channels are muted for a predefined time (cancel not possible, no reset).
- The marker mute stops automatically after 30 s.
- You cannot cancel the function.

NOTICE:

- Only for ACU6100-X-(XXX5) Fixed Wing Variant.

*For more information refer to the software manual "CSW6100..." (www.becker-avionics.com/downloads/ → Intercom).

3.13 Loudspeaker Operation



Speaker key

Loudspeaker Operation

The function "SPEAKER" must be enabled in the configuration*.

The DVCS6100 system has two speaker channels which are assigned by default to ACU1 and ACU2.

- Push to the key "SPKR".
 - The speaker is on.
 - The related LED is on.
 - All selected TX/RX channel signals and warnings are audible through the loudspeaker.

NOTICE:

- The default state for the loudspeaker on/off/last state can be set in the configuration.
- When PTT is pushed then the loudspeaker will be muted to prevent acoustic feedback.
- When the speaker is on voice-controlled intercommunication (VOX) function is muted.

*For more information refer to the software manual "CSW6100..." (www.becker-avionics.com/downloads/ → Intercom).

3.14 Emergency Operation



Back-up switch
(depends on variant)
(pull to unlock the position)

Toggle switch with 2 or 3 locked positions (depends on variant).
The back-up switch is used for the selection of the operation mode:
BACK-UP: Emergency operation.
NORM: Normal operation.
SLAVED: Slaved operation.

CAUTION:
In emergency mode, only a subset of the functionality is available.

3.14.1 Slave Operation

If there is a total loss of pilots or copilots ACU61 (ACU1, ACU2), the device can be connected in parallel to the remaining ACU61 through the slaved mode.
The slaved mode is a first step of security in the case when ACU1 or ACU2 appears to be defective.

Emergency Operation - Slave Operation



Back-up switch
(depends on variant)
(pull to unlock the position)

- Pull the switch to unlock the position.
- Manual selection to position "SLAVED".
 - The related mike and phone are now connected in parallel to the remaining ACU.

Notice:

- Slaved mode is only possible for ACU1 and ACU2.

Status at the device in slaved mode:

- All keys and knobs are without functions.

Status at the other devices in the installation:

- No limitations.

3.14.2 Back-Up Operation

- The emergency operation (back-up operation) can be started manually through the selection switch for the back-up function on the ACU61.
- The emergency operation (back-up operation) starts automatically e.g. if there is total power failure or if a fatal defect occurs in the internal supply of the device.

Emergency Operation - Back-Up Operation



Back-up switch
(depends on variant)
(pull to unlock the position)

- Pull the switch to unlock the position.
- Manual selection to position "BACK-UP".
 - ACU1 and ACU2 are in back-up mode.
 - ACU3... are no longer in operation.
 - Headset 1 (normally the pilot) is connected to TX1 and FIX1.
 - Headset 2 (copilot) to TX2 and FIX2.
 - Intercom volume level is decreased to 50%.
 - CVR level is decreased to 50%.

Status at the device ACU1 and ACU2:

- Limitations in the scope of functionality.

Status at the other devices in the installation:

- All keys and knobs are without functions.

3.15 Built-In Tests

- The ACU61 device has different built-in tests with optical indication of the test results.
- The tests monitor the system equipment and some internal circuits.
 - PBIT: A system self-test starts after power-on.
 - CBIT: A background test routine runs continuously during normal operation.
 - IBIT: An additional test can be manually started.

3.15.1 Power-on Build-In Test (PBIT)

Power-on Build-In Test (PBIT)

- The ACU6100 powers up with the main system power.
- The test routine will be started (test time ca. 4 s).
 - The test status LED (yellow) is on.
- After successful test without failure the test status LED is off.
- If a failure was found the test status LED (yellow) flashes.

There are two procedure to continue, if a failure was found:

- (1) Push at the "TEST" button the failure will be ignored.
 - If there is permanent problem inside the system, it will be found by the continuous self-test routine and indicated again.
- (2) Set the "BACK-UP" switch to slaved or emergency mode (details see "Emergency Operation" page 60).

3.15.2 Continuous Build-In Test (CBIT)

Continuous Build-In Test (CBIT)

- A background test routine runs continuously during normal operation.
- If a failure was found the test status LED (yellow) flashes.

There are two procedure to continue, if a failure was found:

- (1) Push at the "TEST" button the failure will be ignored.
 - If there is permanent problem inside the system, it will be found by the continuous self-test routine and indicated again.
- (2) Set the "BACK-UP" switch to slaved or emergency mode (details see "Emergency Operation" page 60).

3.15.3 Initiated Build-In Test (IBIT)

Initiated Build-In Test (IBIT)

TEST

- An additional test can be manually started.
- Push the key "TEST" (not during transmission).
- If a failure was found the test status LED (yellow) flashes.

There are two procedure to continue, if a failure was found:

- (1) Push at the "TEST" button the failure will be ignored.
 - If there is permanent problem inside the system, it will be found by the continuous self-test routine and indicated again.
- (2) Set the "BACK-UP" switch to slaved or emergency mode (details see "Emergency Operation" page 60).

3.16 ACU6100-X-(X9X) - RX Variant

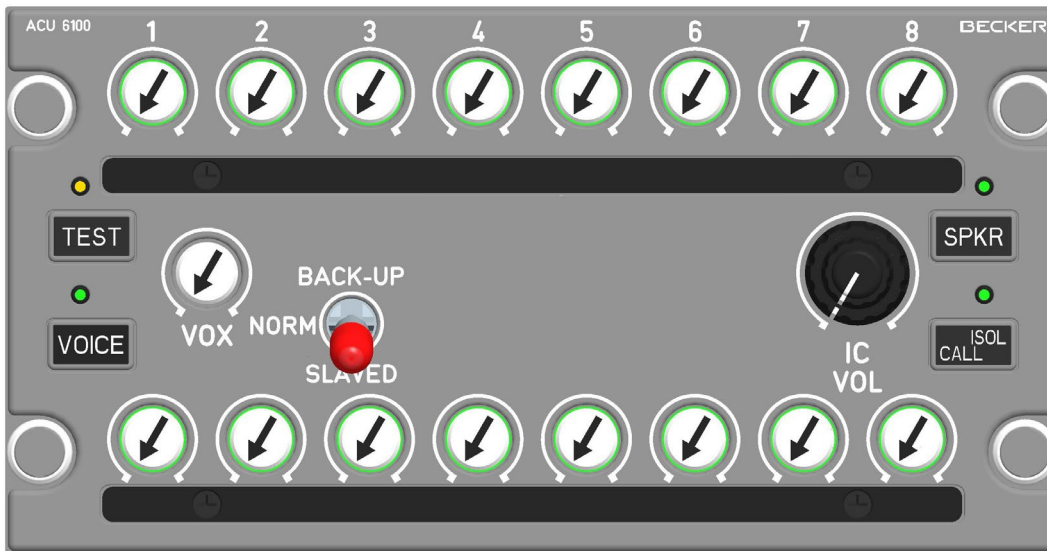


Figure 24: ACU6100-X-(X9X) - RX Variant

This variant has:

- No mike selector.
- No PTT switch.

Functions:

- Monitoring of up to 16 receivers (RX-channels) and the individual volume control.
- The voice filter functionality is only available on the lower RX row.
- Aircraft intercommunication in VOX mode.
- The operation and function of the control and indication elements are the same as described in this chapter.

3.17 ACU6100-X-(XXX5) - Fixed Wing Variant



Figure 25: ACU6100-X-(XXX5) - Fixed Wing Variant

This variant has:

- 1x toggle switch (2 locking positions) for "NORM" and "EMER" mode
- 1x toggle switch (2 locking positions) for "MIC" and "MASK" mode.
- 1x Marker/Mute key.

Functions:

- "NORM"/EMER" see "Emergency Operation" page 60.
- Position "MIC": Mike operation with headset or hand mike.
- Position "MASK": Oxygen mike operation. Switch activates an external relay to switch over between standard mike and oxygen mike operation.
 - The speaker function is automatically on. With a short push to the "SPKR" key the speaker is off.
- "MKR/MUTE": see "Marker Mute" page 59.
- "TEST": With a short push to the "MKR/MUTE" and "VOICE" key at the same time can the IBIT be started. Details see "Built-In Tests" page 61.
- The operation and function of the control and indication elements are the same as described in this chapter.

3.18 Contact Data

In case of additional questions contact your local Becker Avionics dealer or forward your request direct to Becker Avionics "Customer Service".

In the event of damage or a defect, the entire device must be returned for repair. The repair must be done by trained Becker Avionics personnel.

For department and addresses, please see contact info page 2.

Any change by the user excludes any liability on our part (excluding the work described in this manual).

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