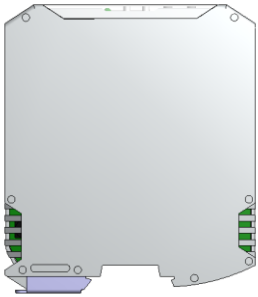
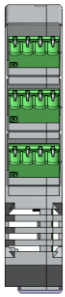
INSTALLATION AND USER MANUAL

CAN RC TRANSMITTER MODULE





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Document No.	040-2013-01	Document Version	**F**
Document Date	17-06-2013	Document Revision date	22-01-2021

IMPORTANT INFORMATION

About this instruction

The information in this manual was - at the time of printing - true and correct. Kwant Controls does not accept any responsibility for eventual inaccuracies and/or omissions. The Kwant Controls policy is to continuously improve and update their products. Therefore, Kwant Controls reserves the right to change and update the product specification without any prior notice. As a result of this there could arise unavoidable differences between product and manual. This manual has been prepared in the English language. Other languages are available upon request. Please send your request to kwant@kwantcontrols.nl Costs for this will be invoiced.

NB: Please read this manual carefully before using this product and save this manual for future use.

Notifications regarding safety

This manual is only to be used by authorized staff who are understanding the risks involved in (working with) live electrical equipment and only if all safety precautions are met. Failures, damage or defects could affect the safety and should be resolved immediately.

The Equipment is to be installed and used in accordance with the instructions attached. If not, this might lead to physical injury, damage to the vessel and/or reduced performance of the product. Switch off the power before installing the Equipment.

Although this product has been developed to function accurate and reliable, it's functioning can be influenced by several factors. Therefore, please always use your common sense and navigation skills. Please see to it that there will always be a watch who can immediately respond to changed circumstances.

Compliance with EMC standards

All equipment and accessories as described in this Installation and User Manual have been developed in accordance with the highest industrial design- and production standards and do comply with the electromagnetic compatibility (EMC) standards. However, good performance requires good installation.

Packing and Storage

Goods will be packed in cartons or in cases, both seaworthy packing. The cartons and boxes should be stored in a dry environment and are not suitable for outdoor storage. All applied wood is in accordance with IPPC/HT ISPM 15 requirements (International Plant Protection Convention).

Classification and directives

In accordance with the rules and regulations of:

American Bureau of Shipping	: ABS
Bureau Veritas	: BV
Det Norske Veritas / Germanischer Loyds	: DNV-GL
Russian Maritime Register of shipping	: RMRS
Registro Italiano Navale	: RINA
Nippon Kaiji Kyokai	: Class NK
China Classification Society	: CCS
Loyds Register of Shipping	: LRS

Contents

1 SAFETY

1.1 General

Please read this manual before working with the equipment. Keep this user and installation manual near the equipment, so that it can easily be found for consultation.

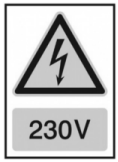
Warnings, Notes and Pictograms may not be covered or deleted from the equipment and should be readable during the life span of the equipment. Unreadable or damaged Warnings, Notes and Pictograms should be replaced and are, on request, available at the manufacturer.

The equipment has been designed and produced with most care and meets all legal safety rules and regulations. Careless use could result in damage to the equipment, personal injury or other damage. The equipment should be used in a technically correct state and only for the purpose for which is was designed.

1.1.1 Responsibility

Kwant Controls B.V. takes no responsibility for installation or operation of the equipment. If there is any doubt about how to install or operate the equipment, the company responsible for the installation or operation should be contacted. It is not allowed to modify the equipment or to have it opened by unauthorized personnel. If opened anyway, the warranty, manufacturer's responsibility and issued (test-) certificates will be lost!

1.1.2 Power supply AC/DC



Installing and maintenance of the equipment may imply work with dangerous currents and voltages. Therefore, the installation and maintenance should only be carried out by authorized staff who are understanding the risks involved in (working with) live electrical equipment and only if all safety precautions are met. Failures, damage or defects could affect the safety and should be resolved immediately.

Be aware of the hazardous live currents and voltages. Do not touch any AC/DC measurement inputs as this could lead to injury or death. Make sure you perform all installation operations that are required for the equipment before voltage is applied to the equipment. Gather and secure all wires and cables neatly.

1.1.3 Lifting points

If packages are suitable for lifting gear, they will be marked at the appropriate lifting points. Follow the current national health and safety regulations/ standards strictly.

1.1.4 Handling

Do not expose the instruments to severe shocks or vibration!
Do not drop the instruments!
Do not expose the instruments to mechanical stress!
Do not stand on the instruments!
Handle the instruments with care!

1.2 Maintenance

1.2.1 General

Maintenance-, Service- and Repair activities should only be carried out by authorized staff understanding the risks involved in (working with) live electrical equipment, in accordance with the rules and requirements of the manufacturer and only if all safety precautions are met.

Before starting Maintenance-, Service- or Repair activities, the following precautions should be taken:

- Turn off the main power switch and secure it against unintended use.
- Keep all parts clean.
- Avoid dust concentrations and dirt.
- Periodically check the electrical connections, wiring and the insulation.
- Keep the prescribed terms for periodical maintenance- and service activities.
- Maintenance that was carried out should be recorded.

1.2.2 Power supply

Maintenance/Installation activities to the electric/electronical system should only be carried out by authorized staff. When carrying out service and maintenance work, the equipment must be deactivated and disconnected. Machinery in operation (eletrical or mechanical) requires the presence of at least one additional person who can operate the main power emergency switch in case of emergency. An electric shock can be fatal!

In case of repair or replacement of electrical parts, ensure these have been correctly grounded again. The rules and regulations valid for electrical technology, especially those concerned with safety precuations, must be observed. In case of doubt, please contact Kwant Controls B.V. We will gladly advise you!

1.2.3 Spare Parts

Only apply parts which adhere to the conditions for operation and repair as prescribed by the manufacturer. Always use the correct amperage when changing fuses.

1.2.4 Water, Moisture and Dust

All parts of the electrical instalation must be protected against Water, Moisture and Dust. Essential functions, such as safety circuits may not operate properly, people and the equipment could be damaged.

1.2.5 Inspection

Check whether the electrical/mechanical equipment is in accordance with the applicable rules and regulations. Where defects are discovered, they must rectified immediately by authorized staff.

1.3 Personal

1.3.1 General

Maintenance/Installation activities on the electric/electronical system should only be carried out by authorized staff. Temporary employees and trainees are only allowed to work on the equipment under supervision and responsibility of competent staff. Responsibilities and qualifications of staff have to be defined clearly.

Stay alert! Be careful to avoid injury! Do not use the equipment when you are not focused. Keep the working environment clean. Ensure good lighting. Make sure that the equipment is not accessible during maintance. Know your responsibility, also for the safety of others.

1.3.2 Contact

In case of failures or problems with the equipment, the responsible staff should be informed and the equipment should be shut down and secured immediately. Failures and defects have to be rectified as soon as possible.

1.3.3 Technical documentation

Be sure that the maintenance is executed in accordance with the instructions and regulations. In case of a failure, competent staff has to follow up the trouble shooting procedure on the basis of the failure indication on the control panel.

1.3.4 Personal Protective Equipment (PPE)

Wear all prescribed personal protective equipment, such as safety shoes, gloves etc. Take precautions for hearing protection when the sound pressure level at the workstation exceeds 85 dB(A). Fire extinguishers shall be present at the work station. Ensure that the operation and the position of the extinguishers is well known.

The equipment may only be switched on when there are no staff in the danger zone and not before eventual failures/defects have been rectified.

2 SUPPORT

2.1 Contact

Kwant Controls has a technical customer service team. In case support and/or information is required, you can contact us by phone or e-mail. You can also send your question to our service department directly by email at service@kwantcontrols.nl

Kwant Controls B.V.
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8600 AA Sneek- Holland
Website : www.kwantcontrols.com
E-Mail : service@kwantcontrols.nl
Phone : +31 515 413 745
Fax : +31 515 422 478

2.2 Spare-parts / Service

For spare-parts and service on the equipment, please contact the manufacturer. We refer in this to Chapter 2, item 2.1.

2.3 Help us when you ask for help

In case service and/or support is required by you, please provide us with the following information:

- Type of equipment.
- Model number.
- Serial number.
- Software version number.
- Manufacturing order number.

3 GENERAL DESCRIPTION OF THE EQUIPMENT

3.1 CAN RC transmitter module

The CAN RC Transmitter Module reads CAN lever information (e.g. speed or azimuth) on the CANbus and converts this information to current level settings of the 2 DAC outputs.

The device offers flexibility of application with 4 predefined modes of operation for speed and 1 mode of operation for azimuth. All modes have configurable parameters that define the transfer functions for speed and azimuth. The device also allows for configuration via the CANbus in order to get more complex configuration of up to 12 points.

4 relays outputs provide additional signaling for STOP, AHEAD, ASTERN and HEALTH. The signaling characteristics of the first three relays are configurable.

In the default operation modes (node 0x5), the devices acts on CAN messages on the CANbus with the format: 0x185 - <speed lsb> - <speed msb> - <azimuth lsb> - <azimuth msb>.

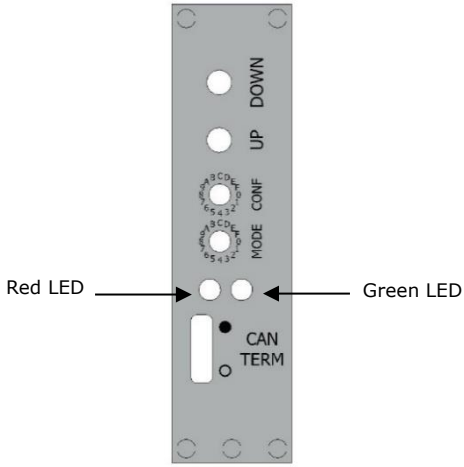
The following table describes the main characteristics of the different modes of the device.

	Mode 0	**Mode 1**	**Mode 2**	**Mode 3**
Speed conversion	AHEAD ONLY, NON-LINEAR	AHEAD & ASTERN	AHEAD & ASTERN v-profile	AHEAD & ASTERN v-profile
Azimuth conversion	-180° .. 180°	-180° .. 180°	-180° .. 180°	-180° .. 180°
Number of adjustable conversion parameters	5	5	5	6
Default limits current loop speed	4 .. 20 mA	4 .. 20 mA	4 .. 20 mA	4 .. 20 mA
Default limits current loop azimuth	4 .. 20 mA	4 .. 20 mA	4 .. 20 mA	4 .. 20 mA
Absolute limits current loop speed	0.. 20 mA	0.. 20 mA	0.. 20 mA	0.. 20 mA
Absolute limits current loop azimuth	0.. 20 mA	0.. 20 mA	0.. 20 mA	0.. 20 mA
Conversion accuracy	<1%	<1%	<1%	<1%
STOP RELAY	yes	yes	yes	yes
AHEAD RELAY	yes	yes	yes	yes
ASTERN RELAY	no	yes	yes	yes
HEALTH RELAY	yes	yes	yes	yes
CANbus speed input	0 .. 1000	-1000 .. 1000	-1000 .. 1000	-1000 .. 1000
Azimuth input	-1800 .. 1800	-1800 .. 1800	-1800 .. 1800	-1800 .. 1800

NOTE: Default mode 1 is selected.

3.2 Device operation

3.2.1 Interface



3.2.2 MODE – Rotary

The 'MODE' rotary selects the operating mode, but is also used for configuring the device.

MODE	Despription
0	Ahead only, non-linear conversion.
1	Ahead and Astern, symmetric.
2	Ahead and Astern v-profile, symmetric.
3	Ahead and Astern v-profile, non-symmetric.
4	Not used.
5	Configure Azimuth parameters.
9	Configured via CAN.
D	Configure Contelec parameters.

3.2.3 CONFIG – Rotary

The 'CONFIG' rotary selects the parameter that needs to be changed. Each mode has it is own parameters so make sure the 'MODE' rotary is in the right position during configuration.

During normal operation the 'CONFIG' rotary must stay in position 0. During configuration the red LED is on and the CAN-to-CURRENT processing is not active.

CONFIG	Despription
0	Normal operation.
1	Adjust P1 current parameter.
2	Adjust P2 current parameter.
3	Adjust P3 current parameter
4	Not used.
5	Adjust P5 speed parameter.
6	Adjust P6 speed parameter.
7	Adjust P7 speed parameter.
8	Adjust P8 stop relay lower limit speed.
9	Adjust P9 stop relay higher limit speed.
A	Adjust P10 ahead relay activation speed.
B	Adjust P11 astern relay activation speed.
C	Enable or disable the second DAC.

3.2.4 Up-Switch

- CONFIG ROTARY = 0 : Switch between normal operation (green LED, slow blinking) and 'CONFIG' mode (green LED, fast blinking).
- CONFIG ROTARY > 0: Increase current for the selected parameter.

The up-switch is not active during normal operation.

3.2.5 Down-switch

- CONFIG ROTARY = 0 : Switch between normal operation (green LED, slow blinking) and 'CONFIG' mode (green LED, fast blinking).
- CONFIG ROTARY > 0: Decrease current for the selected parameter.

The down-switch is not active during normal operation.

3.2.6 Green LED

- 'NORMAL' operation : The green LED Blinks @1Hz.
- 'CONFIG' mode : The green LED blinks @0,5Hz.

If the green LED is continuously off or on it indicates a fatal error.

3.2.7 **Red LED**

Normal operation: The red LED is off or the red LED blinks with a pattern to indicate an error (see table below). If there is more than 1 error the red LED will only indicate the smallest error number.

If the device is in error, the red LED blinks in a pattern, indicating the source of the problem. The error pattern starts with none, one or two long blinks, followed by one or more short blinks. The long blinks indicate the source of the problem, the short blinks indicate the type of problem within that source.

Pattern		Error description
Long	Short	
0	1	Memory checksum failed.
0	2	One or more relays failed.
0	3	Mode error. Configured mode of the device does not match the mode of the config rotary switch.
1 / 2	1	DAC 1 or DAC 2 (depending on the long signal) current loop is interrupted.
1 / 2	2	DAC 1 or DAC 2 is overheating.
1 / 2	3	DAC 1 or DAC 2 current output is unreliable.
1 / 2	4	CAN is not receiving CAN messages (timeout).
1 / 2	5	CAN input is indicating problem. Likely a sensor configuration issue.
1 / 2	6	CAN input is out of the expected range.

3.2.8 **Termination Switch**

When active this switch terminates the CANbus input with a split termination 120 Ohms.

3.2.9 **Health Relay**

The health relay is activated when one or more alarms occur.

3.3 Configuration

The characteristics of the current response and the response of the relays' can be changed by adjusting the default parameters. After powering the device, the configuration can be changed within the first 5 minutes of operation (after each configuration change, the timer allows for another 5 minutes of configuration changes). If this timeout ends, the configuration can no longer be changed while the device is powered.

The device internally stores 1 configuration. This configuration holds the points that determine the output current and when the relays are switched. It also holds the mode of operation that matches this configuration. If the configured mode and the running mode (set by the mode rotary switch) do not match, the configuration error is activated. This can be solved by either putting the rotary switch in the matching mode or by resetting the device to the default parameters. This ensures that the active mode of operation can be seen from the physical device.

3.3.1 Configuration Preparation

Connect the device to the CANbus and the relays and choose a preferred mode of operation by adjusting the mode rotary to the correct mode.

3.3.2 Read factory default configuration

If the up or down switch is held when booting the device, the factory default configuration for the set mode (the set mode of the MODE rotary switch) is read and overwrites any previous configuration. This is only needed at first use of the device or when changing mode of operation.

Step 1: SELECT MODE

Set rotary 'MODE' to mode 0, 1, 2 or 3.

Each mode has it is own set of parameters. Make sure to select the right mode.

Step 2: READ FACTORY DEFAULTS

While pressing the up or down button, power up the device (by applying 24 volt to it. When the green led starts blinking (after about 1 second), the button can be released and the device is in factory defaults for the selected mode of operation. You can now continue to configure the parameters. Note that configuring parameters needs to be done within 5 minutes after the last configuration change or boot.

3.3.3 Configure speed conversion parameters

Step 1: SELECT PARAMETER

Select a parameter with rotary 'CONFIG' and continue with step 2a or step 2b.

Step 2a: If CONFIG is P1 or P2 or P3

This parameter is a current. The A-meter now reads the current setting for this parameter. Adjust the current setting with the up/down switches. To save settings go to step 3. To change more parameters first go to step 2a.

S***tep 2b:*** If CONFIG is P5, P6 or P7

This parameter is a speed setting (-1000 .. 1000). Set the lever to the speed position you want for this parameter. Now press the up or down switch once. This parameter is now set. To save settings now go to step 3. To change more parameters go to step 2b. Note that the speed setting of these points cannot be set lower or higher than its neighboring points.

Step 3: SAVE SETTINGS

Set rotary 'CONFIG' back to 0. The new settings are now saved in flash and the device automatically goes back to normal operation.

3.3.4 Configure azimuth conversion parameters

Step 1: SELECT MODE 5

Set rotary 'MODE' to mode 5 (mode 5 is only used for azimuth configuration. Mode 5 is not an operational mode)

Step 2: SELECT PARAMETER

Select a parameter with rotary 'CONFIG' and continue with step 3.

Step 3: If CONFIG SELECT is P1 or P2

This parameter is a current setting. The A-meter now reads the current setting for this parameter. Adjust the current setting with the up/down switches.

To save settings go to step 4. To change more parameters first go to step 2.

Step 4: SAVE SETTINGS

Set rotary 'CONFIG' back to 0. The new settings are now saved in flash.

Step 5: BACK TO NORMAL OPERATION

Set rotary 'MODE' back to the normal mode of operation (mode 0, 1, 2 or 3).

3.3.5 Configure relay response parameters

Do note that the relays in the device are not mutually exclusive. This means that multiple relays can be configured to be switched on at the same time.

Step 1: SELECT PARAMETER

Select a parameter with rotary 'CONFIG' and continue with step 2.

Step 2: if CONFIG is 9, 10 or 11

This parameter is a speed setting (-1000 .. 1000). Set the lever to the speed position you want for this parameter. Now press the up or down switch once. This parameter is now set. To save settings now go to step 3. To change more parameters go to step 2.

***Step 3*:** SAVE SETTINGS

Set rotary 'CONFIG SELECT' back to 0. The new settings are now saved in flash.

3.3.6 Enable or disable DAC2

In some cases no signal is needed for the second DAC.

Step 1: SELECT PARAMETER

Select parameter **C** with rotary 'CONFIG'.

Step 2: PRESS UP OR DOWN SWITCH

Pressing the UP switch enables use of the second DAC, pressing the DOWN switch disables the use of the second DAC.

***Step 3*:** SAVE SETTINGS

Set rotary 'CONFIG' back to 0. The new settings are now saved in flash and the device automatically goes back to normal operation.

3.3.7 **Configure Contelec sensor**

In mode 13, the devices operates in Contelec sensor mode. This means that the sensor values that are expected on the CAN input are in the range of 0 to 4095. The output is a straight line on DAC1, while DAC2 is disabled.

Step 0: SELECT MODE

Set the rotary 'MODE' to mode 13.

Step 1: FETCH DEFAULT CONFIGURATION

Press the UP or DOWN switch and power the device. This fetches the defaults for this mode and sets the internal configuration to expect use of mode 13.

Step 2: SELECT PARAMETER

Select a parameter with rotary 'CONFIG' and continue with step 3.

Step 3: If CONFIG SELECT is P1 or P2

This parameter is a current setting. The A-meter now reads the current setting for this parameter. Adjust the current setting with the up/down switches.

To save settings go to step 4. To change more parameters first go to step 2.

Step 4: SAVE SETTINGS

Set rotary 'CONFIG' back to 0. The new settings are now saved in flash and the device automatically goes back to normal operation.

3.3.8 **Configuration via CAN**

In mode 9, the devices operates in CAN mode. This allows configuring all 12 internal points per DAC and the 3 relays (K1, K2 and K3).

Step 0: SELECT MODE

Set the rotary 'MODE' to mode 9.

Step 1: FETCH DEFAULT CONFIGURATION

Press the UP or DOWN switch and power the device. This fetches the defaults for this mode and sets the internal configuration to expect use of mode 9.

Step 2: CONFIGURE THE DEVICE BY SENDING SDO PACKAGES

Configuration via CAN is done by sending SDO packages on the CAN bus. In operating mode, the device listens to PDO packages of the format <CanId> - <field0 lsb> - <field0 msb> - <field1 lsb> - <field1 msb> - <alarm sensor0> - <alarm sensor1>.

main	sub	Bytes	Field	Meaning
0x2000	0x01	1	Mode	Set the mode of operation (9 for CAN)
0x2000	0x02	1		Not used
0x2000	0x03	2	DAC1 CanId	Set the CAN id where DAC1 listens to (default 0x185)
0x2000	0x04	1	DAC1 Field	Set the field where DAC1 listens to (default 0) allowed values: 0 and 1
0x2000	0x05	2	DAC2 CanId	Set the CAN id where DAC2 listens to (default 0x185)
0x2000	0x06	1	DAC2 Field	Set the field where DAC2 listens to (default 1) allowed values: 0 and 1
0x2010 (DAC1), 0x2020 (DAC2)	0x01–0x0C	2	DAC x point	For each of the 12 points of this DAC, set the x value that triggers the change in output. Values between -1000 and 1000 for speed, between -1800 and 1800 for azimuth.
0x2011 (DAC1), 0x2021 (DAC2)	0x01-0x0C	2	DAC y point	For each of the 12 points of this DAC, set the y value that triggers the change in output. Values between 0 (0 mA) and 54600 (20 mA).
0x2030 (DAC1), 0x2040 (DAC2)	0x01-0x03	2	DAC K[1-3] x on	For each DAC, each of the three relays (STOP, AHEAD, ASTERN) set the x value that triggers the relay to switch on.
0x2031 (DAC1), 0x2041 (DAC2)	0x01-0x03	2	DAC K[1-3] x off	For each DAC, each of the three relays (STOP, AHEAD, ASTERN) set the x value that triggers the relay to switch off.

3.3.9 Reset configuration to default

Reset to default procedure:

- Power down the device.
- Press and hold the up or down switch during power up.
- Hold the switch until the green led blinks @2Hz. The default settings are now restored.

3.4 Available options

Not Applicable.

3.5 Main technical specification

24 VOLTS DC

Supply input, U [Volts]	: Min.18 / Nom.24/ Max.32
Power input, I [mA]	: Min.40 / Nom.50 Max.100
CAN bus interface	: CAN standard electrical signaling, 124 Ohm termination selectable. (see termination switch)
Enclosure	: IP20
STOP relay output (oc) [mA]	: Nom.25 / Max.30
AHEAD relay output (oc) [mA]	: Nom.25 / Max.30
ASTERN relay output (oc) [mA]	: Nom.25 / Max.30
HEALTH relay output (oc) [mA]	: Nom.25 / Max.30
Current loop speed output, I [mA]	: Max.20
Current loop speed output, U[Volt]	: Max.8
Current loop speed output, R [Ohm]	: Max.400
Current loop azimuth output,I [mA]	: Max.20
Current loop azimuth output, U [Volt]	: Max.8
Current loop azimuth output, R [Ohm]	: Max.400
Temperature	: -25°C to +70°C
EMC Class	: Group 1, Class A
Environmental Classification Report	: 9505 332 322XX 001
For further specification, see data sheet	: 040-2013
Date of manufacturing	: 2013

The total maximum lifetime (storage before use + lifetime in use) is not limited to a fixed period, but would, however, be minimum 15 years. The equipment should be visual inspected at each major service and/or overhaul of the ship.

Note: Specifications are subject to change without prior notice

3.6 Diagrams and flow charts

Diagrams and flow charts depend on the execution of the equipment/system which usually is a customized / custom made product which requires specific diagrams. These documents are available upon request. Please contact Kwant Controls B.V. We refer in this to Chapter 2, items 2.1. & 2.3.

3.7 Compass safe distance

The Standard compass is a magnetic compass used for navigation, mounted in a suitable binnacle containing the required correcting devices and equipped with suitable azimuth reading device.

The steering compass is a magnetic compass used for steering purpose mounted in a suitable binnacle containing the required correcting devices

The Standard and Steering compass safe distance for the CAN RC Transmitter Module is > 1 m.

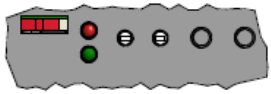
3.8 Classification and directives

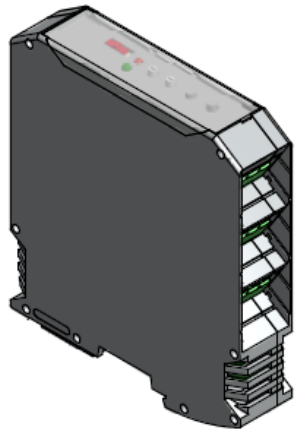
The CAN RC Transmitter module. fulfil the IEC 60945.and has been type approved by the leading classification bureaus ABS, BV, CCS, DNV, GL, LRS, NKK, RINA and RMRS.

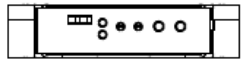


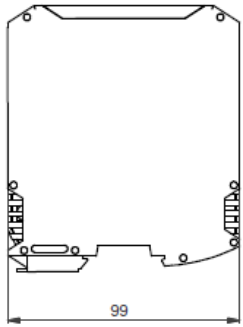


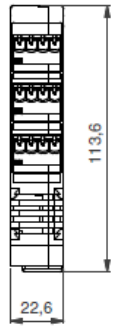










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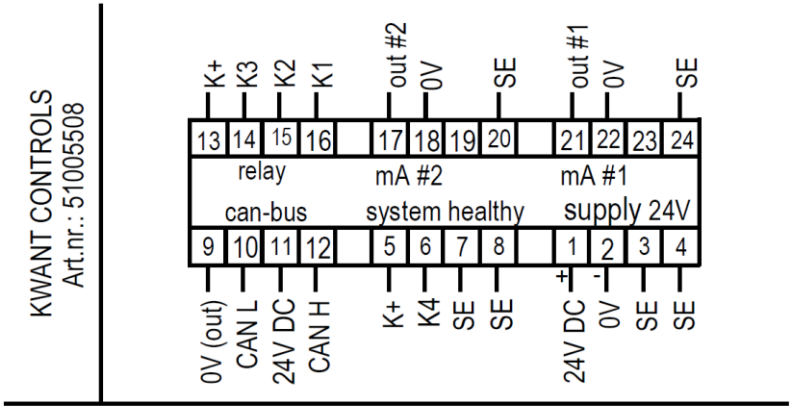
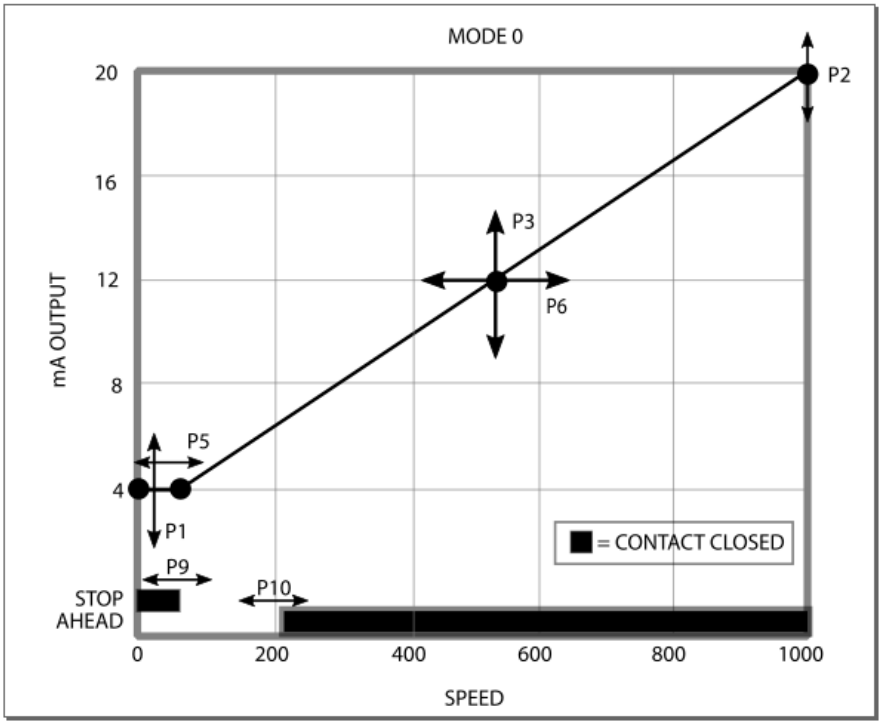
Title: CAN RC transmitter module				Part no: A0131081	
Description: DIN rail mounting			Sheet: A4	Rev.: 0	Scale: 1:2
Dimensions in millimeters		Engineer: PV	L.mod. date: 11-6-2013		Art.: 51005508
Copyright according to law		Drawn by: EvD	Creation date: 10-6-2013		Sheet: 1 /1



CONNECTION DIAGRAM RC Transmitter



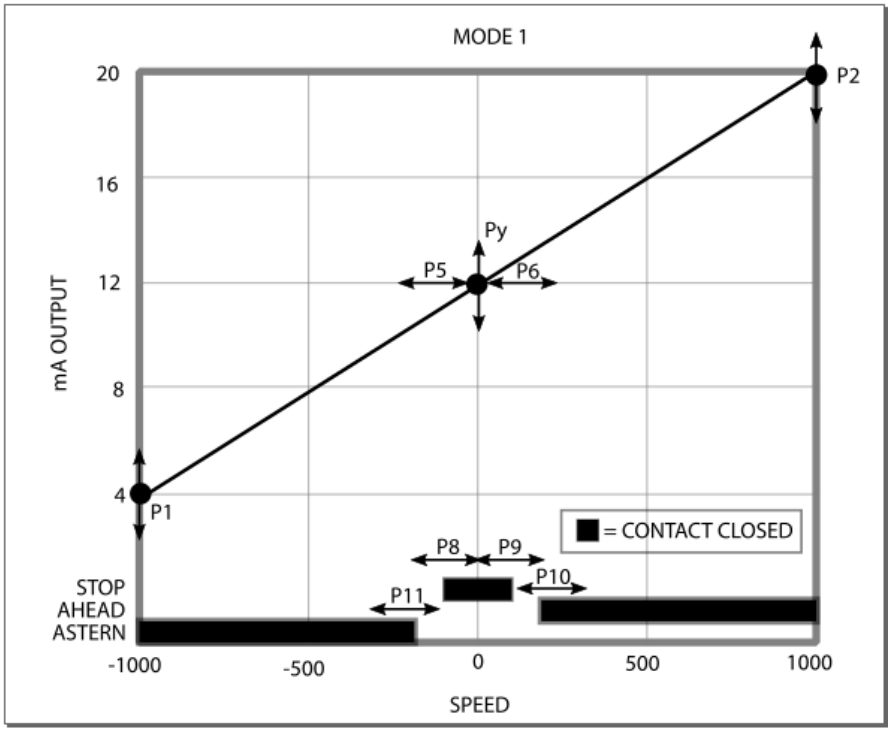
Factory defaults

Output: DAC1

CAN id: 0x185

Points: 50 (P5), 4 mA (P1),
500 (P6), 11,58 mA (P3),
1000, 20 mA (P2)

Relays: stop: 0 - 50 (P9),
ahead: 200 (P10) - 1000



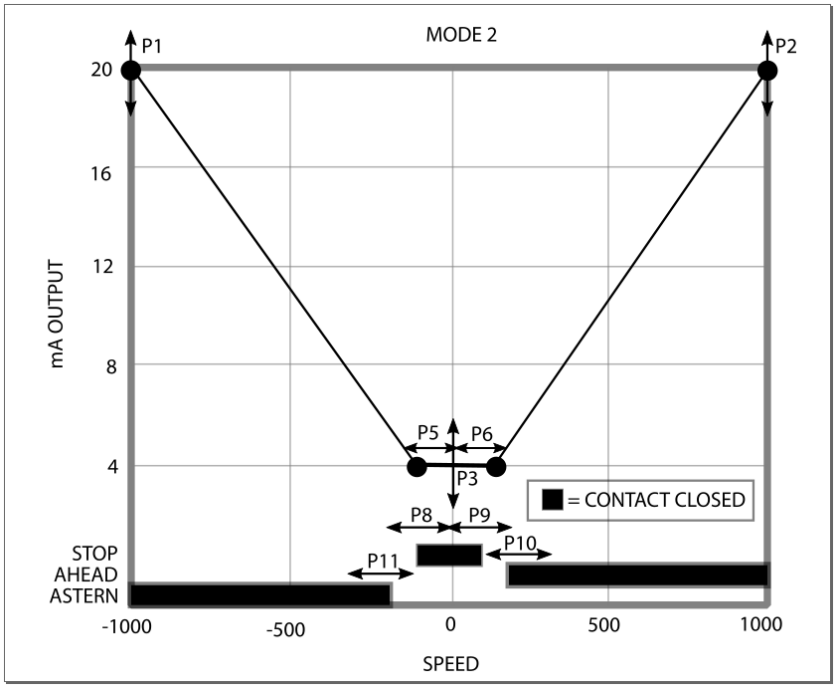
Factory defaults (default configuration)

Output: DAC1

CAN id: 0x185

Points: -1000, 4 mA (P1),
0 (P5), Py=P1+(P2-P1)/2 = 12 mA
0 (P6), Py=P1+(P2-P1)/2 = 12 mA
1000, 20 mA (P2)

Relays: stop: 0 - 50 (P9),
ahead: 200 (P10) – 1000
astern: -1000 - -200 (P11)



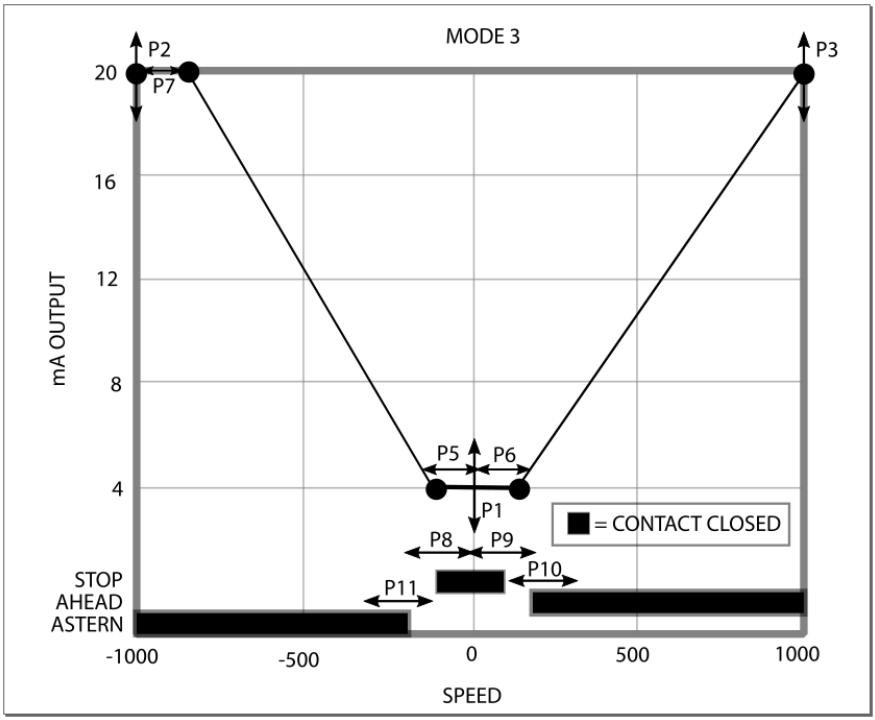
Factory defaults

Output: DAC1

CAN id: 0x185

Points: -1000, 20 mA (P1),
-50 (P5), 4 mA (P3),
50 (P6), 4 mA (P3),
1000, 20 mA (P2)

Relays: stop: -50 (P8) – 50 (P9),
ahead: 200 (P10) - 1000,
astern: -1000 - -200 (P11)



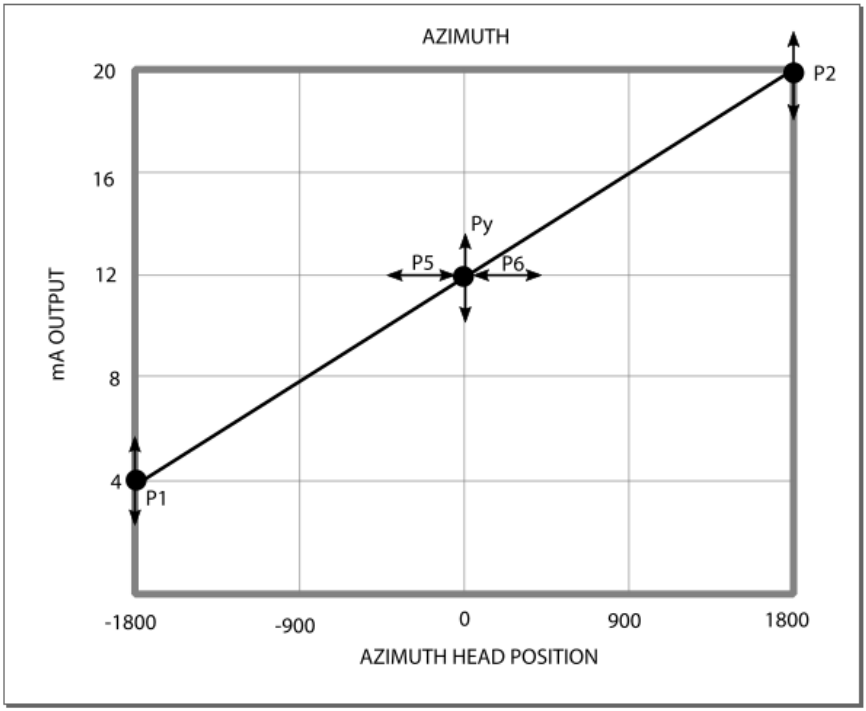
Factory defaults

Output: DAC1

CAN id: 0x185

Points: -1000, 20 mA (P1),
-900 (P7), 20 mA (P1),
-50 (P5), 4 mA (P3),
50 (P6), 4 mA (P3),
1000, 20 mA (P2)

Relays: stop: -50 (P8) – 50 (P9),
ahead: 200 (P10) - 1000,
astern: -1000 - -200 (P11)

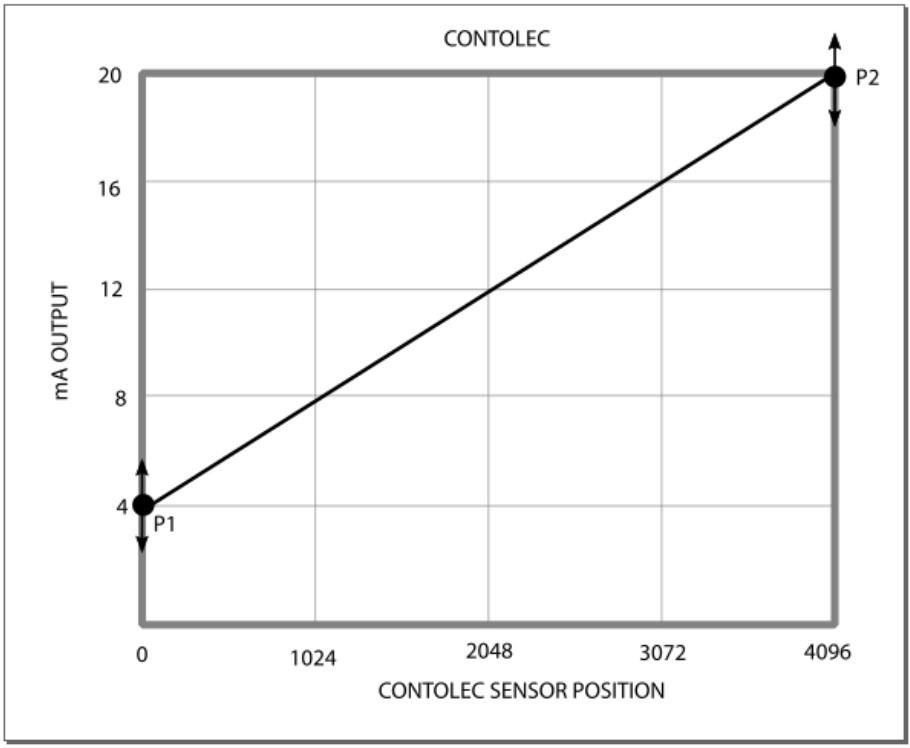


Factory defaults

Output: DAC2

CAN id: 0x185

Points: -1800, 20 mA (P1),
0 (P5), Py=P1+(P2-P1)/2 = 12 mA
0 (P6), Py=P1+(P2-P1)/2 = 12 mA
1800, 20 mA (P2)



Factory defaults

Output: DAC1

CAN id: 0x185

Points: 0, 4 mA (P1),

4096, 20 mA (P2)

4 COMMISSIONING

4.1 Procedure

As it is not possible to provide a procedure for each installation variant, only general guidelines on the installation of the equipment(s) as described in this installation and user manual and respective tools are provided. The procedures have to be adjusted to each specific situation.

ATTENTION: Maintenance of a safe construction.
If holes have to be provided (i.e. for cabling and/or mounting of the instrument) please ensure that these will not cause any danger by weakening of parts of the construction of the vessel.

4.2 Unpacking

Unpack the Equipment(s) as described in this installation and user manual and check whether all parts are included. In case it is found that the instrument is damaged or parts are missing, please contact immediately Kwant Controls B.V.

4.3 Mounting

Mounting of instrument/equipment may only be carried out by authorized staff. Ensure that during mounting the instrument cannot be damaged by tools and that no tools are left in the equipment. Left tools can damage the equipment irreparably.

Mount the instrument in the available panel cut out or at the foreseen spot. Mount the instrument only by means of tools provided for that purpose. Mounting tools/parts which are not suitable for mounting the instrument can damage the equipment. Ensure that all instructions as described in this installation and user manual will be carefully followed up.

4.4 EMC guidelines for installation

All equipment and accessories as mentioned in this installation and user manual have been designed in accordance with the most severe industrial standards for design and manufacture and meet the standards/directives for electromagnetic compatibility (EMC). However, correct installation is critical to the performance of the Equipment.

Although every effort has been taken to ensure that they will perform under all conditions, it is important to understand what factors could affect the operation of the product. Before starting the installation, please take time to find out which is the best position for the instrument, so that it will meet the EMC Directives.

For advise and further information on the installation of the instrument you may contact the Kwant Controls' Service Dept.: service@kwantcontrols.nl

4.5 Compass safe distance

For the correct operating of the ships steering compass, the Compass safe Distance which is stated on the equipment should duly be taken into account.

5 DECLARATION OF CONFORMITY FOR MATERIAL DECLARATION MANAGEMENT

Document No. 06-D05.

Kwant Controls B.V. declares that the equipment listed in this manual is manufactured in their workshops to a high professional standard by trained and qualified workforce and complies with the required specifications.

5.1 Equipment

The equipment and the materials and substances in the equipment are in accordance with the following EU legislation including recent amendments:

Directive 2011/65/EU dated 03-01-2013 of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

Directive 2012/19/EU dated 27-01-2012 of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE).

Regulation No 1907/2006/EC of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

Directive No 2004/12/EC dated 11-02-2004 of the European Parliament and of the Council amending Directive 94/62/EC on packaging and packaging waste - Statement by the Council, the Commission and the European Parliament.

Directive 2014/90/EU dated 23-07-2014 on Marine Equipment, of the European Council and the Council (repealing Council Directive 96/98/EC).

International Maritime Organization (IMO) Resolution MSC.282 (86), adopting SOLAS REG.II-1 / 3-5, prohibiting the installation of materials containing asbestos on all ships from 01-01-2011.

5.2 Design and Manufacturing Processes

Our Design and Manufacturing process and quality are managed in accordance with the following Quality Management System Standards and approved by Det Norske Veritas/Germanischer Lloyd (DNV-GL):

NEN ISO 9001:2015
NEN ISO 14001:2015

5.3 Materials and Components

The materials and components used in our equipment are of first class quality and meet, as far as possible, the required operation of the equipment. Materials and components specified by the client are included in the production of the equipment unless agreed otherwise.

All of our incoming materials are procured via certified suppliers or via reliable co-sources. On base of our supplier statements we conclude that the materials used in our products do not contain any prohibited hazardous, ozone depleting substances, asbestos or nuclear contaminated substances at any time and are compliant with the European Union legislation as listed in Annex 1. Regular checks to ensure that the materials do not contain hazardous or nuclear contaminated substances or asbestos are performed and filed.

The electronic modules, may contain a small amount of lead used in the solder connections to ensure the reliability of electrical connections. Polyvinylchloride (PVC) may be used in cable ducts and in wiring. Polycarbonate (PC) and Acrylate

(PMMA) are used in protective covers and text plates. Polyacetal (POM) is used in handle bars and in the switches.

5.4 Recycling and Disassembly

Our equipment does not require special procedures for disposal. Decommissioned products are to be treated as normal electric and electronic waste and shall not be thrown into household waste but be separated for correct recycling. For environmentally sound recycling, check the local regulations for correct disposal of electronics.

6 WARRANTY

6.1 General terms and conditions

General terms and conditions can be found in the document:

"General terms and conditions of contract KWANT CONTROLS B.V. Voltastraat 3, Sneek – Holland" and are available free of charge upon request. Please send your request to kwant@kwantcontrols.nl.

These terms have been filed at the Chamber of Commerce, Leeuwarden, Holland.

In this document you will find:

- Warranty – General.
- Warranty - Goods delivered.
- Warranty - Services provided.
- Warranty - Infringements of intellectual property rights.

7 APPENDIX

7.1 Disclaimer

Kwant Controls B.V. is registered in the trade register Leeuwarden under number 01012434. The information contained in this document is confidential and may be legally privileged. Please note that any disclosure, copying, distribution, or taking any action in relation to the contents of this information is strictly prohibited and may be unlawful. Every precaution has been taken to ensure accuracy of this document. However, Kwant Controls does not accept any responsibility for errors and omissions. Neither is any liability accepted for damages resulting from the use of this product and the information contained in this document. Kwant Controls B.V. reserves the right to change any of the contents of this document without prior notice. This document has been prepared in accordance with NEN5509.

7.2 Rules and Regulations of the Russian Maritime Register of Shipping

The product has all Russian classification Code of Products

TR 648700 Integrated bridge system / Pitch /Rudder Angle / propeller indicators.
TR 644900 Engine Room telegraph.
TR 649200 Remote control systems for main engines.

The equipment mentioned in this installation and user manual are in accordance with the Rules and Regulations of the Russian Maritime Register of Shipping, with inspection and certification and in accordance with the Technical Regulations on the Safety of Sea Transport Items (RF Government order No. 620).

NOTE


MANAGEMENTSYSTEEM CERTIFICATIE
DNV·GL
ISO 9001 = ISO 14001