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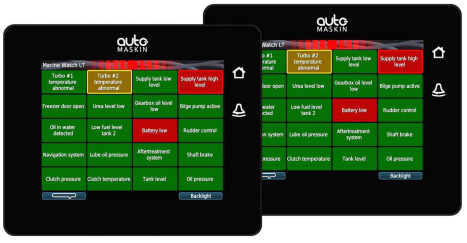
Installation Manual

Marine Pro 200 Series and RP 420E

DCU 210E/208E - Engine Controller
RP 210E/220E/206E - Remote Panel
RP 420E - Remote Panel

Marine Watch LT Series

LT-ONE Main Panel
LT-ACE Remote Panel



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1 Preface

1.1 About this Manual

This manual has been published primarily for professionals and qualified personnel.
The user of this material is assumed to have basic knowledge in marine systems, and must be able to carry out related electrical work.

⚠ Work on the low-voltage circuit should only be carried out by qualified and experienced personnel.

Installation or work on the shore power equipment must only be carried out by electricians authorized to work with such installations.

1.2 Responsibilities

⚠ It is the sole responsibility of the installer to ensure that the installation work is carried out in a satisfactory manner, that it is operationally in good order, that the approved material and accessories are used and that the installation meets all applicable rules and regulations.

ⓘ Auto-Maskin continuously upgrades its products and reserves the right to make changes and improvements without prior notice.

All information in this manual is based upon information at the time of printing. For updated information, please contact your local distributor.

The crossed-out wheeled bin symbol indicates that the item should be disposed of separately. The item should be handed in for recycling in accordance with local environmental regulations for waste disposal.

By separating a marked item, you will help reduce the volume of waste sent to incinerators or land-fill and minimize any potential negative impact on human health and the environment.

1.3 Revisions

Revision	Date	Description
1.0	2015-09-02	Initial release.
1.1	2015-09-04	Corrected thermistor terminals on page 6.
1.2	2016-02-09	Updated the connector pinout description page 6.
1.3	2016-02-15	Added connections drawing page 12.
1.4	2016-03-18	Thermistor 2, 3 and 4-wire drawings.

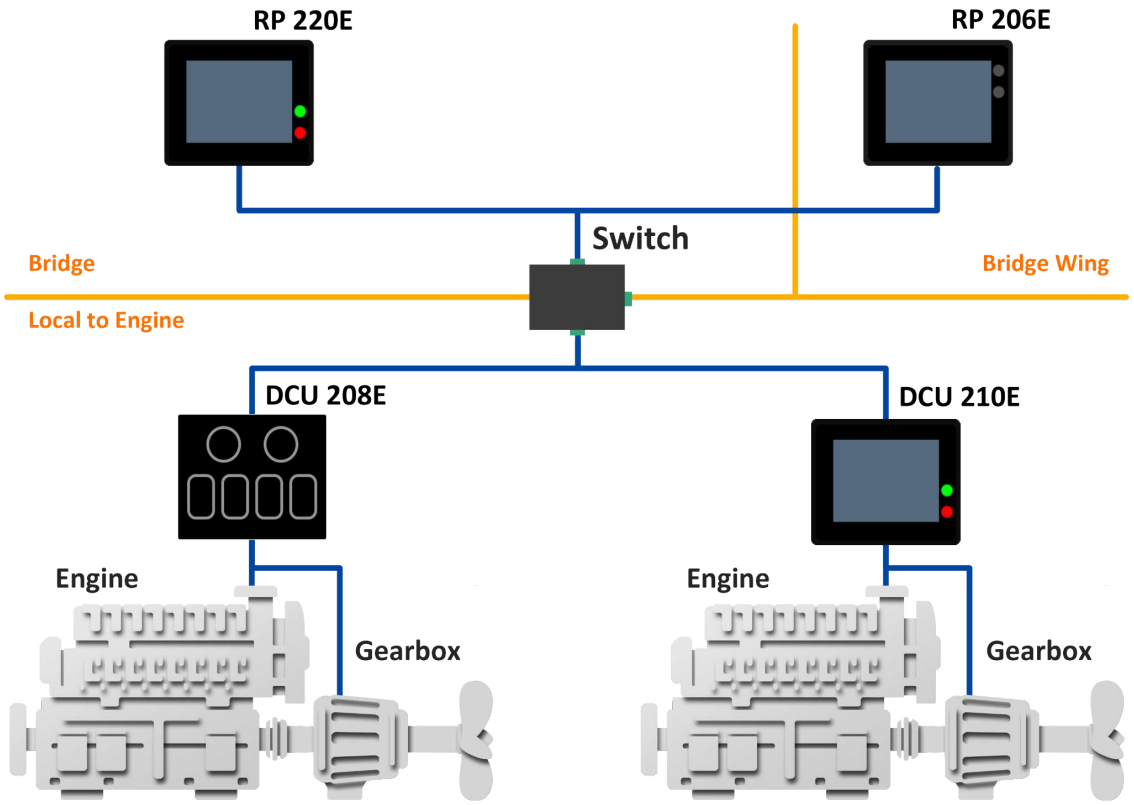
Revision	Date	Description
1.5	2016-11-25	RP 220E added.
1.6	2017-09-25	Added installation notes released to Ethernet and switches. Added voltage sensor inputs. Updated to SW 3.6. Communication I/O link updated.
1.7	2019-11-01	Added Marine Watch LT Panels and RP 206E Remote Panel.
1.8	2020-12-17	Based on a new template.
1.9	2022-05-23 2024-01-29 2025-04-09	Clarified “Panel Location” chapter. Added caution to touch screen. All glass design update (picture and dimensions) Logotype update + cutout size aligned with information in datasheet
1.10	2025-05-16 2026-02-05	Added RP 420E. Added relays for RP and LT-ACE products.

2 Ordering Information

The Marine Pro and Marine Watch series covers a wide range of compatible products within both the series. Please visit our website for more information.

3 Overview

3.1 Overview of the 200E Series



The drawing above shows a typical layout.

3.1.1 DCU 210E Engine Controller

The DCU 210E Engine Controller is the main building block in the 200 Series.

Engine sensor values are displayed on the color touch screen. Commands and other user interaction can also be performed from this panel.

3.1.2 DCU 208E Engine Controller

The DCU 208E Engine Controller is basically the same as the DCU 210E, but without the color touch screen.

It saves cost being used in smaller engine rooms, where a Remote Panel is all that is needed.

3.1.3 Configuration

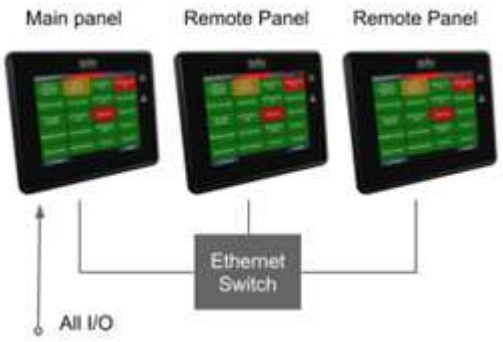
Any PC with a browser (such as Chrome, Edge) can be used to configure the DCU. Simply point the browser to the IP address of the DCU.

3.1.4 RP 210E/220E/206E/420E Remote Panel

The optional RP Remote Panel brings everything on the DCU to a remote location, with the exact same user interface. The Remote Panel self-configures to the DCU, thus removing the need for any configuration on the RP. As such, the RP can easily be retrofitted.

The RP also supports one IP camera to be installed on the network.

3.2 Overview of the Marine Watch LT Series



3.2.1 LT-ONE Main Panel

The LT-ONE is the main building block of the Marine Watch LT series. All alarm sensors need to be connected to the LT-ONE, and all configuration is performed on the LT-ONE.

3.2.2 LT-ACE Remote Panel

The optional LT-ACE Remote Panel extends the alarm system to multiple other locations. No configuration is required, as the configuration is synchronized with the LT-ONE.

3.3 Common Components

3.3.1 Ethernet Switch

The Ethernet switch is not necessary if only two units are in use. These can then be wired with an Ethernet cable directly.

It is recommended to make use of an Ethernet switch though, as it simplifies PC configuration connection and future expansion to remote panels and/or camera interface.

For redundant Ethernet connection, *managed* Ethernet switches must be used.

3.3.2 Expansion

The basic system can be expanded with more input and output channels using the versatile RIO units (**R**emote **I**/**O**).

Currently, there are RIO units for

- I/O expansion, RIO 410, RIO 210 and RIO 216..
- Exhaust temperature monitoring, RIO 412
- Generator monitoring, RIO 425
- Load sharing, LSU 408

4 Installation

Installation covers mounting, panel location, wiring and first power-on.

4.1 Mounting

Panels with a screen should be mounted at about eye level and the user should have easy access to operate the panel.

Ensure easy access to the rear wiring.

The panel may be mounted on the engine's supporting structure provided shock absorbers are used either between the structure and the engine, or between the structure and the panel enclosure.

Use a protective cover or mount the panel in a location with reduced risk for:

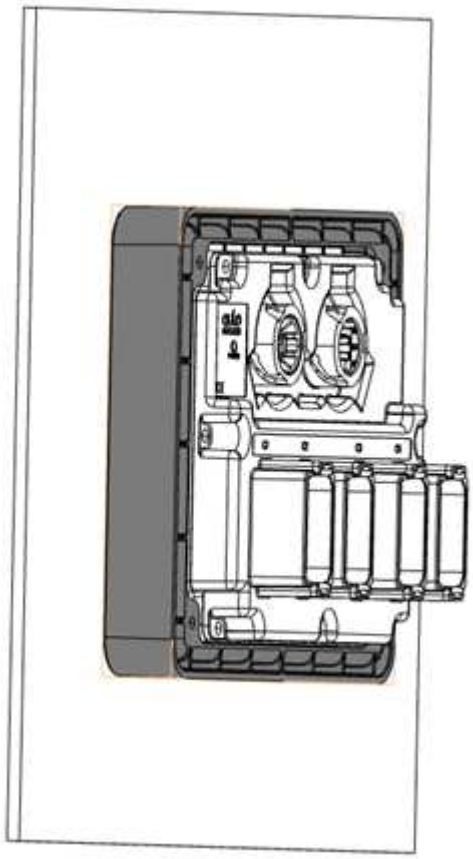
- mechanical damage
- exposure to water or other liquids

4.1.1 Panel Cut-out

The cut-out size is:

- 155 mm width, 123 mm height

4.1.2 Mounting Bracket



The panel installed with the **mounting bracket** shown in grey.

When installing the panel make sure to use the bundled screws and mounting bracket.

If installing the panel on a thicker surface than 5mm, longer flanged screws must be used. In this case M3 16mm flanged screws are recommended.

Make sure that the screws are not too long, as this will damage the panel.

4.2 Panel Location

This section gives basic guidelines for installing the different panels.

4.2.1 DCU 210E

The panel is normally located in the engine room for a number of reasons.

The main reasons are:

- Local operation and overview.
- Minimize cabling requirements and cost from sensors to panel.
- Reduce of electrical noise levels resulting from long cables.

4.2.2 DCU 208E

This panel is also normally installed in the engine room, close to the engine.

Unlike the DCU 210E and the RP 210E/220E/206E the DCU 208E is installed on a DIN rail.

The panel does not have a user interface and is normally used in unmanned engine rooms.

A RP 210E/220E/206E remote panel can be used to bring the signals from the engine room to a monitoring site, e.g. bridge or wheelhouse.

4.2.3 RP 210E/220E/206E/420E

The RP remote panel is normally located at a remote place away from the engine room, but it can also be used in the engine room.

4.2.4 Compatible Panel Series for the 200E Series

Note that the 200 series panel can be used together with the 400 series panels.

For instance can a RP 210E/220E/206E remote panel be used to monitor a DCU 410E Engine Controller.

4.2.5 Marine Watch LT Series

The Marine Watch LT Series panels can be located anywhere.

4.3 Connectors

The picture below shows the connectors on the back lid.

The DCU 208E front view is the same as the DCU 210E rear view.

4.3.1 Connector Kit

The products are not shipped with mating connectors.

A complete kit is available containing all of the mating terminal blocks used on the 200E series.

Kit 1006479 contains:

- 4 Deutsch DT series connectors (DT06-12SA).
- 50 hand crimp sockets 0.5 -1.0 mm^2 (16-20 AWG).
- 10 hand crimp sockets 1.0 -2.0 mm^2 (14-16 AWG).
- 50 sealing plugs for unused terminals.

A crimp tool is necessary for proper crimping of the mating terminals. Use the Deutsch HDT-48-00 crimping tool.

4.3.2 Connector Pinout – DCU 210E/208E and LT-ONE

The table below shows the connector pinout.

The connectors are described as e.g. C1.2, where 1 is the connector number and 2 is the pin number. See Appendix A to see typical sensor connections DCU 210E.

Power		
C1.11	+12/24VDC Primary Supply	In
C1.12	0V Primary Supply	In
C1.3	Ground connection	In

Modbus RTU, RS-485		
C4.3	Shield	
C4.4	Low	
C4.5	High	

RIO Link		
C1.5	Low	I/O
C1.6	High	I/O
CAN J1939 Engine Interface		
C1.7	CAN 1 High	
C1.8	CAN 1 Low	
C1.9	CAN 1 Shield	
C2.10	CAN 2 High - (I/O #20[1])	
C2.11	CAN 2 Low - (I/O #21[2])	
C2.12	CAN 2 Shield - (I/O #5)	
All Faults Relay (Inactive on fault)		
C2.1	NC	-
C2.2	Common	-
C2.3	NO	-
Relays		
C2.4	Relay #1 NC	-
C2.5	Relay #1 Common	-
C2.6	Relay #1 NO	-
C2.7	Relay #2 NC	-
C2.8	Relay #2 Common	-
C2.9	Relay #2 NO	-
Magnetic Pickup		
C4.1	A	In
C4.2	B - (I/O #18[7])	In

Thermistor Input		
C4.6	Thermistor #1 A	In
C4.7	Thermistor #1 B	In
C4,8	Thermistor #1 C	In
C4.9	Thermistor #2 A	In
C4.10	Thermistor #2 B	In
C4.11	Thermistor #2 C	In
Flexible I/O		
C1.1	I/O #1	I/O
C1.2	I/O #2[3]	I/O
C1.4	I/O #3	I/O
C1.10	I/O #4	I/O
C2.12	I/O #5[4]	I/O
C3.1	I/O #6[5] / Power Sensor	I/O
C3.2	I/O #7	I/O
C3.3	I/O #8	I/O
C3.4	I/O #9	I/O
C3.5	I/O #10	I/O
C3.6	I/O #11	I/O
C3.7	I/O #12[6]	I/O
C3.8	I/O #13	I/O
C3.9	I/O #14	I/O
C3.10	I/O #15	I/O
C3.11	I/O #16	I/O
C3.12	I/O #17	I/O

[1] Alternative I/O function is digital input
[2] Alternative I/O function is digital input
[3] Configurable as 0 V reference
[4] Configurable as 0 V reference
[5] Configurable as supply for 0-5V sensors.
[6] Configurable as 0 V reference
[7] Configurable as 0 V reference for MPU input

C4.2	I/O #18[8]	I/O
C4.12	I/O #19	I/O

4.3.3 Connector Pinout – RP 210E/220E/206E/420E and LT-ACE

The table below shows the connector pinout on the RP panel.

The connector is described as e.g. C1.2. Where 1 is the connector number and 2 is the pin number.

Power		
C1.11	+12/24VDC Primary Supply	In
C1.12	0V Primary Supply	In
C1.3	Ground connection	In
Switch Input		
C1.1	Switch Input #1	In
C1.2	Switch Input #2	In
C1.4	Switch Input #3	In
Switch Output		
C2.12	Switch Output #5	Out

All Faults Relay (Inactive on fault)		
C2.1	NC	-
C2.2	Common	-
C2.3	NO	-
Relays		
C2.4	Relay #1 NC	-
C2.5	Relay #1 Common	-
C2.6	Relay #1 NO	-
C2.7	Relay #2 NC	-
C2.8	Relay #2 Common	-
C2.9	Relay #2 NO	-

4.4 Wiring Connections

The following chapter primarily assumes a DCU or LT-ONE panel.

If installing an RP or LT-ACE, then just disregard descriptions that are not described in the table “Connector Pinout RP 210E/220E/206E/420E and LT-ACE”.

4.4.1 General

To protect against EMC noise, we recommend that all cables are shielded.

The shield of all cables shall be connected to ground/hull, not to 0 V.

[8] Configurable as 0 V reference

For good electrical noise separation, consider routing some cables separate from other cables – for instance the pickup signal cable.

Connect the shield to one end of the cable only.

4.4.2 Grounding

In marine installations, ground and 0V volt should not be connected together. In a ship installation, the hull is the “ground” whilst the battery minus is the 0V.

In the DCU system, +12/24V and 0V are filtered to ground using special filter components. This is done to reduce electrical noise entering the system.

Please keep ground and 0V separated!

If ground and 0V are connected, these filters do not work properly.

4.4.3 Power Supply [C1.11 – C1.12]

The panels are designed to run on either 12 VDC or 24 VDC supply voltage.

Make sure the supply power is sourced directly from the battery, and *not* from the starter engine, as the voltage drop over the latter is significant.

The panel must be sourced with an 8-32VDC supply. This is the “full functionality” range.

Use a cable with twisted pair wires to minimize the effect of noise on the supply input.

Connect the cable straight from the battery and keep the cable as short as possible.

Use at least 1.0mm^2 (17 AWG) wires for the power supply.

12 V Supply

If the supply voltage is in the range 8-16 V during the startup wizard, then the panel automatically assumes it is on a 12 VDC system.

24 V Supply

If the supply voltage is in the range 16-32 V during the startup wizard, then the panel automatically assumes it is on a 24 VDC system.

Alarm for Low Power Supply

The input voltage is monitored with fixed set points. The set points are as follows:

24 V supply

- Warning: <21 V

- Alarm: <18 V

12 V supply

- Warning: <11 V
- Alarm: <10 V

The persistence timer is fixed for all set points at 30 sec before a warning or an alarm.

4.4.4 RIO Link [C1.5 – C1.6]

This is the link for the optional expansion units RIO 210, RIO 410, RIO 425 and LSU 408.

Any SDU Safety Shutdown Unit, SDU 404, SDU 410 or SDU 420, can also be connected to the RIO Link.

Use a twisted cable, shielded in the RIO end only.

4.4.5 J1939 CANbus [C1.7 – C1.9 and C2.10 – C2.11]

J1939 CANbus interface for connection to the engine ECM, electronic control module or other J1939 nodes.

4.4.6 All Faults Relay [C2.1 – C2.3]

Note that the relay is activated when there are no faults, and deactivates for any fault.

A “fault” is defined as any new instance in the alarm list, except diagnostic messages graded white.

The relay has a 1 A over-current protection on the common pin.

4.4.7 Relay #1 [C2.4 – C2.6] and #2 [C2.7 – C2.9]

This relay can be configured to activate for any inbuilt function.

See the configuration manual.

The relay has a 1 A over-current protection on the common pin

4.4.8 Magnetic Pickup, MPU [C4.1 – C4.2]

The engine speed pickup is connected here.

Pickup must be of Magnetic (sine-wave) or digital (square-wave) type.

Frequency range: 100 HZ – 10 KHz.

Amplitude range: $2V_{p\text{-}p}$ – $30V_{p\text{-}p}$

Shield the cable at the pickup end only.

4.4.9 Modbus RS-485 [C4.3 – C4.5]

The DCU has an inbuilt Modbus™ interface, both on RS-485 and also on Ethernet. The latter is known as Modbus TCP.

Addressing wise, these are equal, and the complete I/O list is available online here:

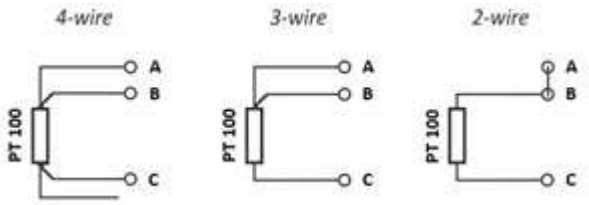
Communication list

Or using this URL: https://goo.gl/MP7EQM

4.4.10 Thermistor Input [C4.6 – C4.11]

There are two thermistor input channels on the DCU.

The channels support sensors with two, three or four wires. See figure below for recommended wiring options.



Measurement range is 95 – 60k ohm.

Detectable failure modes:

- Broken wire between A/B and C
- Short circuit between A/B and C.

4.4.11 Flexible I/O [I/O #1 – I/O #19]

There are nineteen Flexible I/O channels on the DCU.

Each channel can be configured for different uses as described below.

Power Output

All flexible I/O can be configured as 12 V 0.2 A or 24 V 0.2 A power outputs with short circuit detection and protection.

Switch Output

All flexible I/O can be configured as

configurable 12/24V outputs on the DCU or LT-ONE.

Each channel can be configured for any available function.

Voltage Sensor Input

All flexible I/O can be configured as voltage sensor inputs on the DCU or LT-ONE.

The voltage sensor input is capable of measuring 0 – 32 VDC.

Input impedance is 11kΩ.

4-20mA Input

All flexible I/O can be configured as 4-20 mA analog sensor inputs on the DCU or LT-ONE.

If the signal is out of range, a warning will be displayed.

Out of range is defined as:

- < 2 mA (broken wire)
- > 22 mA (short circuit)

Note that the internal impedance is 50Ω.

Switch Input

All flexible I/O can be configured as 12/24 V input channels.

Each channel can be configured as an engine switch, e.g. Oil Pressure Low switch, or it can be configured to activate an inbuilt function, eg. Automatic Start.

Input impedance is 11kΩ.

Use the power supply voltage from C1.11 or a configurable I/O set to power output to power the switch inputs.

See the Configuration manual for more information

4.4.12 Other Interfaces

Ethernet Modbus TCP

The panel connects to a LAN (Local Area Network) or directly to a PC through a standard CAT-5 network cable connected to the RJ45 port.

The IP address in the panel and/or the local PC may need to be changed in order to access the panel configuration from a PC

Do not bend the Ethernet cable or pull the cable sideways more than necessary during installation.

Use a strain relief for the cable making the cable length no more than 50 cm between the connector and the strain relief

USB Memory Interface

This interface is used for two purposes:

- Update of the current configuration file (not RP panels)
- Update the panel firmware (all panels)

Copy a valid configuration and/or firmware file to a USB memory stick, and insert the USB memory stick in the panel.

Follow the instructions that will be appearing on the screen.

4.5 First Power-On

4.5.1 Preparations

First, make sure to consult the Quick Installation Guide (QIG) that came with the panel.

Installation

Install the panel according to guidelines in the QIG.

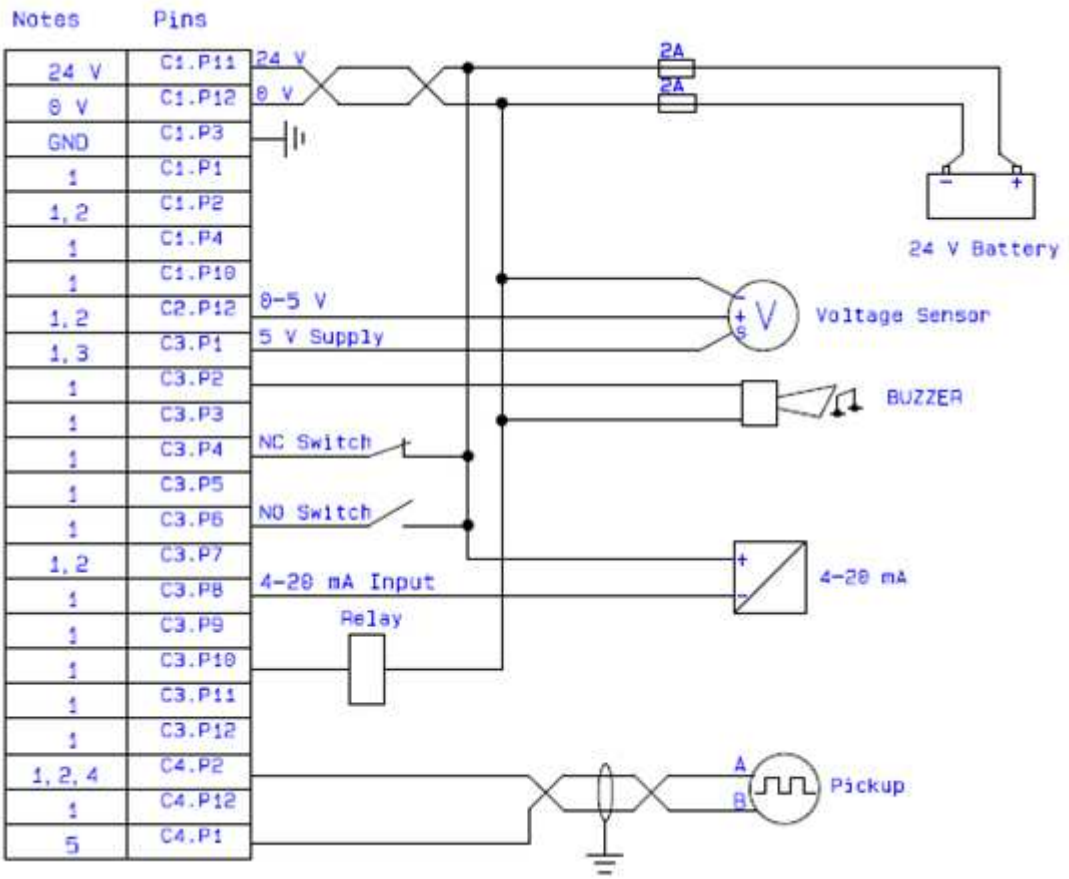
Connections

Connect power to the panel according to guidelines in the QIG.

4.5.2 First Power-On Wizard

The panel (not DCU 208E) will display the first power-on wizard at the first power up after delivery, or after a factory reset of the panel. All wizard settings can be changed later.

5 Appendix A - Typical DCU 210E Setup



Notes

1. Configurable as flexible I/O:
   24V Out, Switch Input, User Config Output,
   4-20 mA & Voltage Sensor.

2. 0 V reference.

3. 5 V Supply for 0-5 V sensors.

4. Pickup (A) 0 V.

5. Pickup (B).

There are four Deutsch DT connectors,
with 12 pins in each connector.

E.g C3.P8 is connector 3, pin 8.