

# *MINITRONIC*



**JR**systems

# ***MINITRONIC***

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## Introduction.

# ***MINITRONIC***



A complete Minitronic kit, normally consists of the following components:

For 12/24VDC system;

ECU - Electronic control unit - 880750SSK .

Sensor - 880116.

For 12/24VDC system, with optional interface for magnetic pickup:

ECU - Electronic control unit - 880760SSK

Sensor - 880116.

Minitronic can be used with other products from JRsystems, like:

CCU - Shifter - 875000, -200, -300, -400 series.

### **Properties**

Minitronic is an electronic control unit for automatic shift, Minitronic monitors the speed of the vehicle and activates a suitable gear.

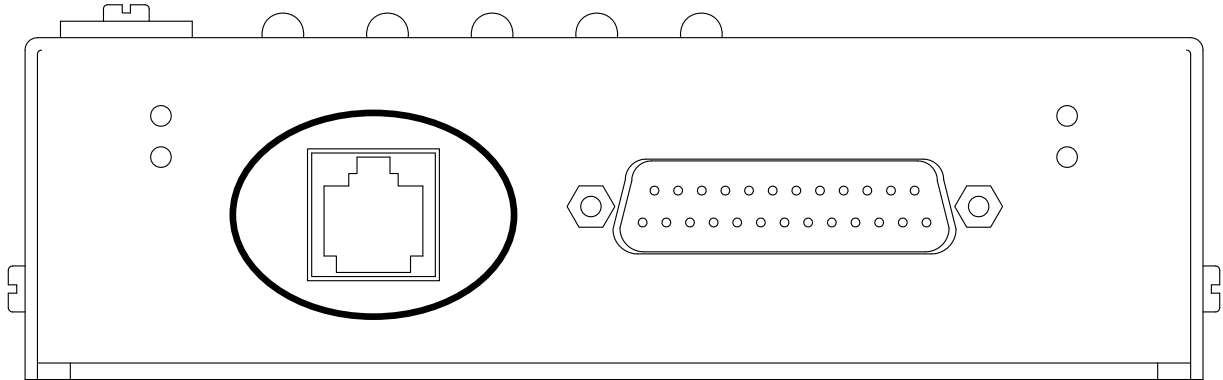
Minitronic is developed for two speed power shift transmissions

Minitronic also have some extra features, like forward-reverse interlock protection, block against activation of a gear (from neutral) at to high engine rpm,

All functions are adjustable before and after installation .

- Control unit with stable speedsensing electronics.
- Different kinds of shifters can be connected.
- Engine and transmission speed can be measured for safety functions.

## Connector P1



### Indicators.

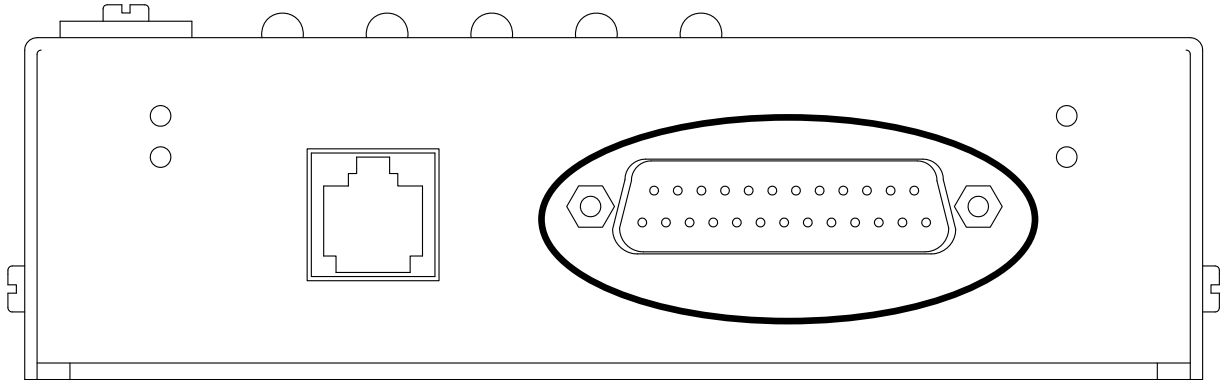
- 01 Red led. Text UP. Indicates when signal from transmission sensor exceeds set value for second gear.
- 02 Red led. Text DOWN. Indicates when signal from transmission sensor falls below set value for second gear.
- 03 Red led. Text SENS. Indicates when signal from transmission sensor exceeds set value for sensor- check.
- 04 Red led. Text ENG. Indicates when signal from transmission sensor exceeds set value for Engine RPM (gear lock).
- 05 Gren led. Text REV. Indicates when signal from transmission sensor exceeds set value for Forward-Rev protection.

### Connection P1

8-pole modular connector for attachment of an external display to Minitronic.  
Pin Function.

- 01 Supply to display
- 02 Signal to indicate sens.
- 03 Signal to indicate inching.
- 04 Signal to indicate lock of first gear
- 05 Signal to indicate reverse gear.
- 06 Signal to indicate forward gear.
- 07 Signal to indicate first gear.
- 08 Signal to indicate second gear.

## Connector P2



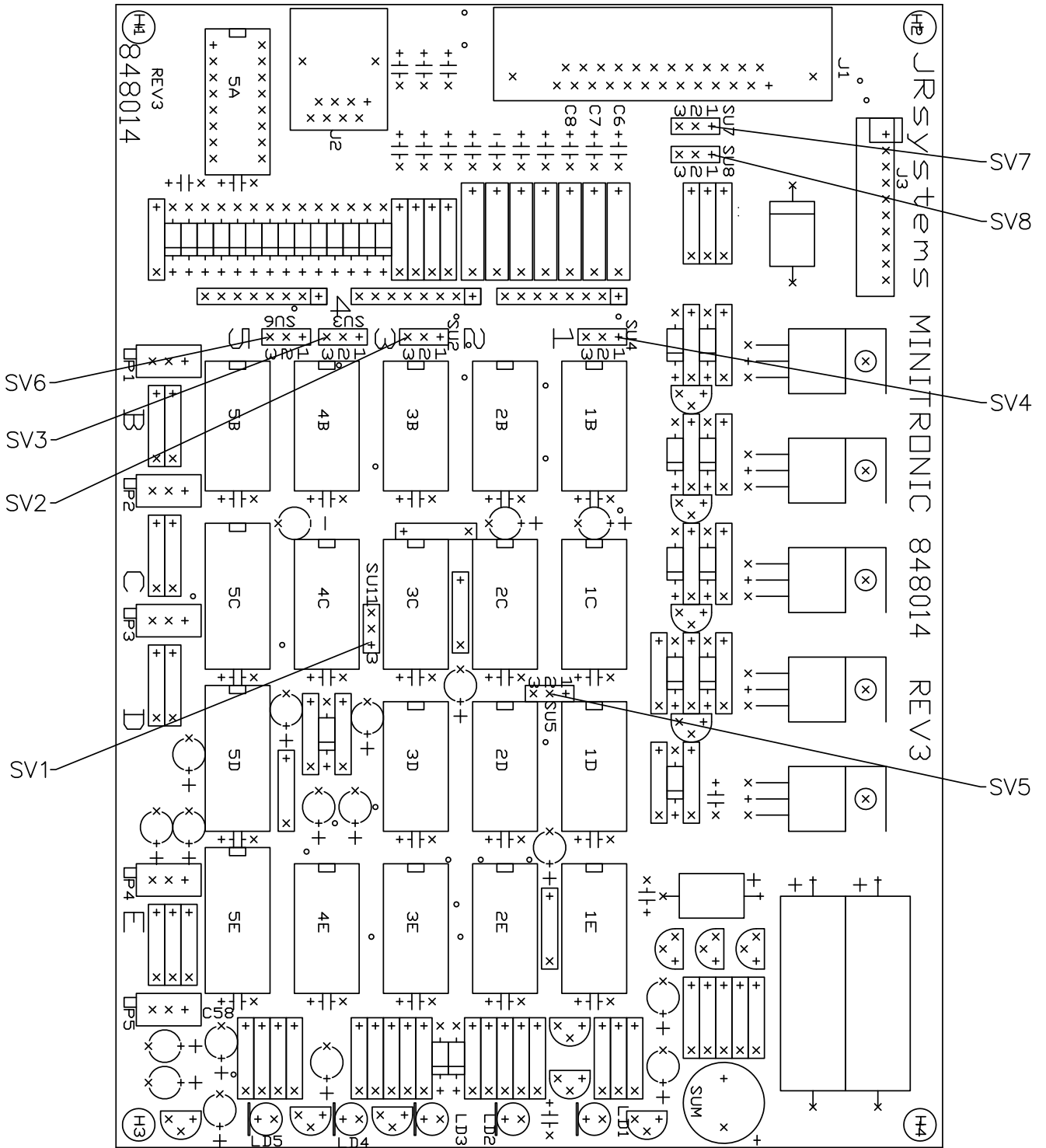
### Connection P2.

25-pole D-sub connector for connections to Minitronic.

Pin	Function
01	Supply 12/24VDC.
02	Ground.
03	Signal from shifter forward.
04	Signal from shifter reverse.
05	Signal from shifter first gear lock.
06	Signal out to valve bank, forward.
07	Signal out to valve bank, reverse.
08	Signal out to valve bank first gear.
09	Signal out to valve bank, second gear.
10	Supply to sensor (PNP).
11	Ground to sensor (PNP).
12	Gear insignal signal to activate gear, (if there is no Forward/reverse signals).
13	Signal in from inchingpedal.
14	Signal in from transmission sensor (PNP).
15	Signal in from engine sensor (PNP).
16	Signal in from engine sensor (Signal Magnetic pickup).
17	Signal in from engine sensor (GND Magnetic pickup).
18	Signal in from transmission sensor (Signal Magnetic pickup).
19	Signal in from transmission sensor (GND Magnetic pickup).
20	Not used !
21	Not used !
22	Not used !
23	Ej använd!
24	Ej använd!
25	Ej använd!

# Adjusting functions.

Minitronic is equipped with eight jumpers to set functions, (picture below).  
See page 7 for jumper settings



## Minitronic jumper setting.

These connector are used to set up the functions. Each connector has three pins and a jumper to connect to two of these pins

The connector pins are numbered 1, 2, 3 on the circuitboard, there are only two ways to set up each connector, connect pin 1-2 or pin 2-3 with the jumper.

See previous page for connector / jumper location on the circuitboard.

Nedan följer en förklaring till varje omkopplares funktion;

- SU1 Shifter signal level, active (high), in first or second gear..  
1-2 = Second gear.  
**2-3** = First gear.
- SU2 Neutral signal from shifter, active high, (signal).  
**1-2** = Signal in gear.  
2-3 = Signal in neutral.
- SU3 Minitronic are using signal on pin 12 connector, or the shifters F-R signals to define neutral.  
1-2 = Minitronic using pin 12.  
**2-3** = Minitronic using fwd/rev signals.
- SU4 Inching pedal, signal (active high) when used, or in resting position.  
**1-2** = Pedal signal when used.  
2-3 = Pedal signal i resting position.
- SU5 Deactivate gear or not, when there is an error.  
1-2 = Go to neutral.  
**2-3** = Stay in gear.
- SU6 Minitronic stays in gear range in neutral, or not, (first second).  
1-2 = First and second (range) active in neutral.  
**2-3** = First and second (range) deactivates in neutral.
- SU7 Engine speed sensor type, PNP or magnetic pickup. If magnetic pickup is selected additional electronics will activate and Minitronic can handle much higher frequencies.  
1-2 = Sensor type PNP used (interface not active).  
**2-3** = Sensor type Magnetic pickup used (interfacet active).
- SU8 Transmission speed sensor type, PNP or magnetic pickup. If magnetic pickup is selected additional electronics will activate and Minitronic can handle much higher frequencies.  
1-2 = Sensor type PNP used (interface not active).  
**2-3** = Sensor type Magnetic pickup used (interfacet active).

(Standard values **bold/underlined**)

## RPM adjustment

Minitronic is equipped with five potentiometers, to adjust rpm settings;

- P1, Engine rpm. set engine rpm where Minitronic prevents gear activation from Neutral. RPM is adjustable between 500--2000rpm.
- P2, Forward / Reverse rpm. Set rpm for Minitronic to prevent directional change, (F / R). RPM is adjustable between 50--500rpm
- P3, Sensor rpm. Set rpm for Minitronic sensor fault detection lower sensitivity at higher rpm . RPM is adjustable between 50-500rpm.
- P4, Shift up rpm, Minitronic shift up to second gear rpm, (this value should always be higher then P5). RPM is adjustable between 100--900rpm.
- P5, Shift down rpm, Minitronic shift down to first gear rpm, (this value should always be lower then P4). RPM is adjustable between 100--900rpm..





## Interface 1 (880760 only).

There are two 10-positions dip switches and one 3-position dipswitch on the interface card (848052).

The two 10-pole dip switches work together through multiplication.  
If you for example would like to divide by 20, you should activate 2 on one of the switches and 10 on the other switch ( $2 \times 10 = 20$ ).

The 10 positions dipswitches are connected to Ing1 and Utg1 on the interface card, where Ing1 is input from magnetic pickup mounted on the engine, and Utg1 is signal out to Minitronic SV7, engine input.

Setting SV7 to pin 1-2, will bypass the interface, normal setting for PNP-sensor, D-sub connector:

Pin 10 supply to PNP-sensor.

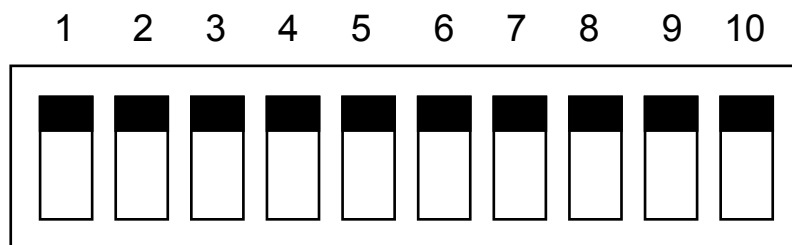
Pin 11 GND to PNP-sensor.

Pin 14 signal from PNP-sensor.

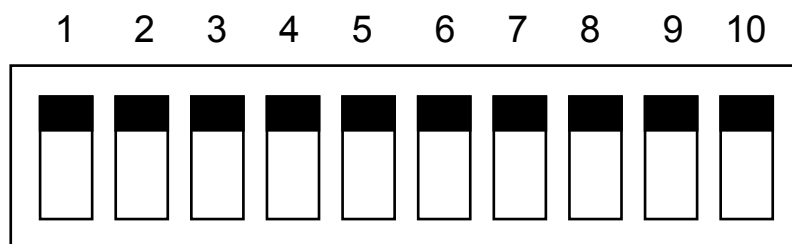
Setting SV7 to pin 2-3, will use the interface, normal setting for magnetic pickup, D-sub connector:

Pin 16 signal from magnetic pickup.

Pin 17 GND to magnetic pickup.



X



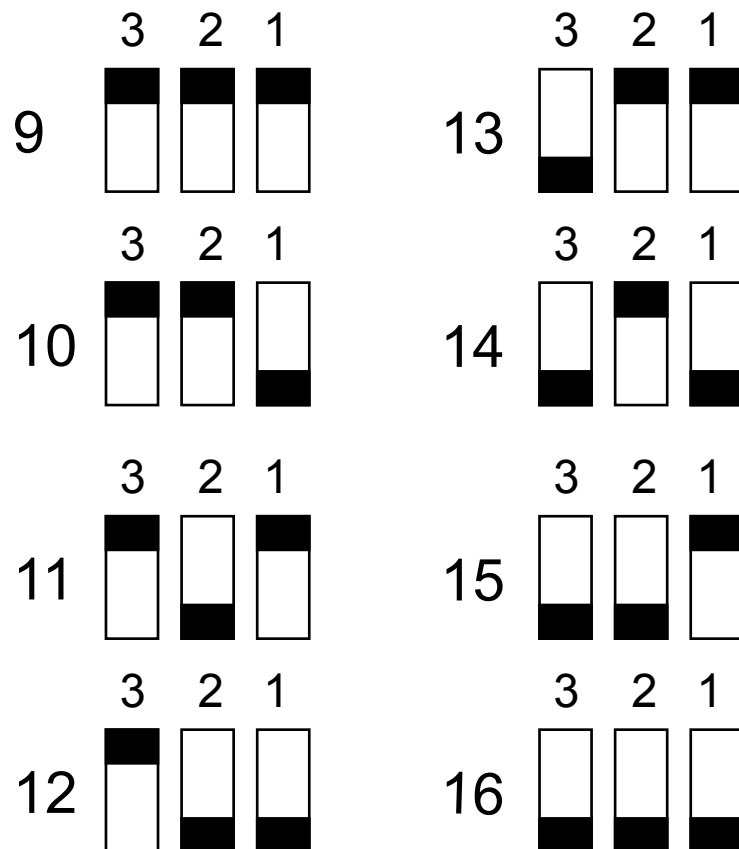
## Interface 2 (880760 only).

The 3 position dipswitch is connected to Ing2 and Utg2, where Ing2 is input from magnetic pickup mounted on the transmission, and Utg2 is signal to Minitronic SV8, transmission input.

Setting SV8 to pin 1-2, will bypass the interface, normal setting for PNP-sensor,  
D-sub connector:  
Pin 10 supply to PNP-sensor.  
Pin 11 GND to PNP-sensor.  
Pin 15 signal from PNP-sensor.

Setting SV8 to pin 2-3, will use the interface, normal setting for magnetic pickup,  
D-sub connector:  
Pin 18 signal from magnetic pickup.  
Pin 19 GND to magnetic pickup

Possible settings for the 3-position dipswitch:



## Technical data.

<b>Number of gears:</b>	2-forward / 2-reverse.
<b>Supply voltage:</b>	12/24VDC.
<b>Consumption:</b>	100mA (idle).
<b>Max load / outlet:</b>	2A.
<b>Type of transmission sensor:</b>	PNP as standard, magnetic pickup as option.
<b>Type of engine sensor:</b>	PNP as standard, magnetic pickup as option.
<b>Weight:</b>	0.6kg.
<b>Material:</b>	Aluminium.
<b>Finish:</b>	Anodized black.

## Notes.




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## important information

### Important information about our control/ecu units

- Check that the contents of the package are according to order confirmation and that the items are in good condition. Put in claim for incorrectness to supplier as soon as possible.
- Ensure a stable voltage source for optimal function. This is true about electric forklift trucks in particular. Supply voltage is 12V or 24V and should be secured with a fuse.
- Wiring harness between the control/ecu unit and the actuator, should not be attached together with the vehicle's power cables, or next to power connections on electric engines, radio transmitters, etc. Do not attach the control unit harness in a closed circle, or through circles of other cables.
- Disturbing effects from relays and other inductive loads used in the vehicle should be neutralised.  
NOTE: This is not valid for PWM-coils.
- Remove the vehicle voltage feed and ground connection from the vehicle, if welding is necessary.
- Make sure that you protect the vehicle against static electricity whenever you work with it. Connect the chair armrest to the vehicle chassis in order to lead away static electricity caused by friction between the driver and the chair. Outgoing negative voltage from any DC/DC converter is preferably to be connected to the vehicle chassis.
- Do not open the control/ecu unit. Contact the service organisation if error occurs. If the control unit is opened or modified the JRsystems AB guarantee will expire. If the control unit is modified or tampered with in any way without JRsystems AB permission, we disclaim our responsibility for the product.
- Do not expose the control/ecu unit to impacts. If someone drop the control unit or similar it should be sent to supplier for control.
- Lever / Miniwheel only, clean the control unit regularly with a damp rag with mild soap solution. The control unit cannot be soaked in water, washed with high-pressure wash or have any other direct contact with water.
- Lever / miniwheel only, the control unit is to be placed on an armrest to give the best ergonomic benefits. Choose an armrest a safety with switch in the joint of the chair. Supply voltage shall be disconnected when the armrest is raised.
- Turn off the control / ecu unit if error indication occurs, and search for and correct the reason. If the problem is in the control unit it should be sent to supplier for repair. Do never use a vehicle with a control unit with error indication.
- Use shielded wires to sensors and connect the shield to the grounded box. Shielded wires should only have one ground connection point.
- Use sealed connectors and gold plated pins/sockets for analogue signals.
- Lever / miniwheel only, include in the daily inspection of the vehicle before every start-up. Check that the control unit is in good condition especially the bellow, the lever and the buttons. If possible check the harness and the connector. Contact the vehicle manufacturer for advice or service if you have any hesitations.
- Recommended wire areas:  $1,5\text{mm}^2$  for supply voltage and ground. Other wires  $0,6\text{mm}^2$ . For EMMI: For use of 5A (Dig out 1 and Dig out 2)  $1,5\text{mm}^2$  is recommended.
- *EMMI only:* To secure the specified EMC requirements even in extreme circumstances, we recommend a ferrite placed on the harness as closed to the control unit as possible. Requirements of the ferrite: Impedance 168 at 25Mh, 250 at 100 MHz, 300 at 300 MHz and 205 at 500Mhz. JRsystems AB part number 848782 or 848783.