PRODUCT CATALOG

Improving the performance of hydraulic equipment by providing innovative electronic controls products

Radio Remote Controls
CAN Enabled Switches
Speed Switches
Temperature Controls
Valve Drivers
## RADIO REMOTE CONTROLS

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### Special Services
- Controls, cabling, packaging, decoration, programming, design

### Compact Remote Modules
- TZM/RZM remote control modules

### Short Range Remote Control
- Motorlink and Microlink economy keyfob systems

## SWITCHES/CONTROLS

### CAN
- CANSWTB, 56 Input CAN transceiver
- CANSW100, Single CAN switch bank
- CANSW600, Multi-CAN switch bank

### Speed
- SS200, Dash mount tachometer / controller
- SS300, Panel mount tachometer / controller

### Temperature
- FC100, Fan controller / smart thermostat
- FRC20/FRC100, Fan reversing controllers

## VALVE DRIVERS

### Multi I/O
- PC1200, Programmable universal I/O module

### Compact Controller Modules
- PC10/PC20, Dual channel driver modules

### Full-Featured Cards
- PC100/PC200, Single/Dual channel cards
Radio Remote Control
Product Selector
Mix and match transmitters and receivers to create an ideal control system

TRANSMITTER MODELS

**T-0**
- NEW
- NOW AVAILABLE
- Our largest and most rugged belly pack yet! The best choice for harsh environments and projects requiring many control devices.

**T-1**
- NOW AVAILABLE
- IR OPTION
- Rugged and versatile belly pack. Many new design improvements. Great for up to 3 joysticks or 6 paddles.

**T-2**
- Compact console is small and versatile. Many control options. Includes belt and neck straps.

**T-3**
- Ergonomic handheld features optional proportional trigger. Tether features available.

**T-4**
- Ergonomic curved housing with arem or waist strap or belt clip. Ideal for toggles or pushbuttons.

**T-5**
- Handheld keypad with custom printed legend. Rubber boot, zipper pouch, and belt clip options.

**T-6**
- SPECIAL ORDER
- Handheld LCD package. Up to 8 pushbutton functions.

**T-7**
- Ruggedized keypad remote with up to 18 buttons.

**TZM-10**
- Compact 2-fuction radio module for hard-wired applications.

**MICROLINK**
- Short-range, fixed frequency miniature and keyfob.

Frequency Specifications: X = 902-928MHz FHSS, Standard 500’ Range; E = 902-928MHz FHSS, Extended 1500’ Range; Z = 2.4GHz ZIGBEE; F = 433MHz Fixed Frequency
Radio Remote Control
Product Selector

Mix and match transmitters and receivers to create an ideal control system

RECEIVER MODELS

R-1 / R-2
Now Available

Compact, potted receiver module with built-in Deutsch connector. Up to 7 solid-state outputs. Up to 16 factory configurable outputs. Mix and match bang-bang, proportional current, ratiometric, or unamplified output types. CAN compatible version available.

1 to 32 outputs can be proportional current, bang-bang, or unamplified voltage. Programmable min/max, ramp up/down. R-1 programmable via built-in LCD/Pushbutton interface. R-2 programmable via optional factory commissioning tool.

Choose 14 or 28 relays, and up to 2 proportional outputs. Rugged NEMA 4 enclosure with Deutsch connector.

R-3

NOW AVAILABLE

R-4 / R-4 CAN

Up to 16 factory configurable outputs. Mix and match bang-bang, proportional current, ratiometric, or unamplified output types. CAN compatible version available.

R-5

Up to 16 or 24 solid-state digital outputs. Up to 2 outputs can be proportional current.

R-6

Compact, potted receiver module with built-in Deutsch connector. Up to 7 solid-state outputs.

RZM-10

Compact 2-fuction radio module for hard-wired applications.

MICROLINK

Short-range, fixed frequency receiver. Momentary or latching.

IRX-2 / IRX-30

IR interface to popular receivers. 2-channel standalone model.

Frequency Specifications: X = 902-928MHz FHSS, Standard 500’ Range; E = 902-928MHz FHSS, Extended 1500’ Range; Z = 2.4GHz ZIGBEE; F = 433MHz Fixed Frequency
OPERATION

Radio Operation
Models available with outdoor range of 1500 feet or more! Frequency hopping spread spectrum (FHSS) transceiver uses two-way communication for maximum reliability and safety. Operates on 902-928MHz (USA) or 2.4-2.4835GHz (International) unlicensed ISM band. No end-user license required.

Controls
Many combinations of toggle switches, joysticks, potentiometers, paddles, and LCD are possible to customize transmitter functions. Use the product configurator to specify functions and labeling. Every transmitter ships with custom engraved front panel and user specified controls.

Transmitter Matching
Momentarily connecting transmitter to receiver using tether cable allows transmitter to “learn” receiver address. Matching the transmitter to the receiver prevents cross communication in applications where multiple radios are in use. This feature also allows the transmitter to be replaced without changing the receiver.

Batteries
Operates from 3 x “D” cell batteries. Rechargeable types can also be used. Internal battery charger option available. Batteries are easily accessible.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX0</td>
<td>Standard range belly pack transmitter</td>
</tr>
<tr>
<td>TE0</td>
<td>Extended range belly pack transmitter</td>
</tr>
<tr>
<td>TZ0</td>
<td>International belly pack transmitter</td>
</tr>
</tbody>
</table>

FEATURES

- **Long-Range Reliability**
  Up to 1,500 feet+ range (line of sight). Monitored radio link keeps equipment under control.
- **Customizable**
  Transmitter is available with toggle switches, joysticks, potentiometers, paddles, or combinations. Choose the ideal combination of controls for your application.
- **Rugged Construction**
  Environmentally sealed for harsh off-highway applications.
- **Tether**
  Tether cable allows transmitter to operate without batteries. Also allows transmitter to “learn” receiver address.
- **License Free**
  Pre-certified FCC - no license required.
- **Standard Batteries**
  Operates from standard “D” cell alkaline or rechargeable batteries. No downtime waiting for specialty battery packs to charge. Internal and external charging systems available.

APPLICATIONS

- Oil field equipment
- Mining and tunneling equipment
- Railroad
- Military vehicles and robots
- Excavating equipment

Adjustable harness included for maximum comfort.
**SPECIFICATIONS**

### Transmitter

<table>
<thead>
<tr>
<th>Frequency</th>
<th>902-928MHz, Unlicensed ISM band standard models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.4-2.4835GHz, Unlicensed ISM band international option</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Frequency hopping spread spectrum</td>
</tr>
<tr>
<td><strong>Frequency Control</strong></td>
<td>Direct FM</td>
</tr>
<tr>
<td><strong>FCC id</strong></td>
<td>OUR9Xcite: Standard range</td>
</tr>
<tr>
<td></td>
<td>OUR9Xtream: Extended range</td>
</tr>
<tr>
<td></td>
<td>OURxBee: International version</td>
</tr>
<tr>
<td><strong>Range (line of sight)</strong></td>
<td>Standard range = 500 feet</td>
</tr>
<tr>
<td></td>
<td>Extended range = 1500 feet</td>
</tr>
<tr>
<td></td>
<td>International = 500 feet</td>
</tr>
<tr>
<td><strong>RF Power Output</strong></td>
<td>Standard range = 5mW</td>
</tr>
<tr>
<td></td>
<td>Extended range = 100mW</td>
</tr>
<tr>
<td></td>
<td>International = 60mW (100mW EIRP)</td>
</tr>
<tr>
<td><strong>Battery Type</strong></td>
<td>3 &quot;D&quot; size alkaline or rechargeable</td>
</tr>
<tr>
<td><strong>Battery Life (Alkaline)</strong></td>
<td>Standard range = Standby, 80 hrs; Transmit, 35 hrs</td>
</tr>
<tr>
<td></td>
<td>Extended range = Standby, 20 hrs; Transmit, 8 hrs</td>
</tr>
<tr>
<td></td>
<td>International = Standby, 15 hrs; Transmit, 6 hrs</td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td>User specified toggles, joysticks, potentiometers, or paddles</td>
</tr>
<tr>
<td><strong>Led Indicator</strong></td>
<td>Flashing = normal; Double blink = battery low</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>High-impact urethane, Polane urethane paint finish</td>
</tr>
<tr>
<td></td>
<td>Plated or powder coated steel guard plates</td>
</tr>
<tr>
<td></td>
<td>Stainless steel, rubber insulated hand rails</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>11-1/4&quot; L x 5-1/2&quot;W x 6-1/2&quot;D</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Under 10 lbs. with batteries for average configuration</td>
</tr>
<tr>
<td><strong>Sealing</strong></td>
<td>IP65</td>
</tr>
<tr>
<td><strong>Environmental</strong>:</td>
<td>Storage -40°C to 85°C</td>
</tr>
<tr>
<td></td>
<td>Operating (Standard) -25°C to 70°C</td>
</tr>
<tr>
<td></td>
<td>Operating (EX rated models) -40°C to 85°C</td>
</tr>
<tr>
<td></td>
<td>Battery operating range: Alkaline (Duracell), -20°C to 54°C</td>
</tr>
<tr>
<td></td>
<td>NiMH (Powerizer), -30°C to 60°C</td>
</tr>
<tr>
<td></td>
<td>Lithium Thionyl Chloride Primary (Powerizer), -55°C to 85°C</td>
</tr>
</tbody>
</table>
FEATURES

- **Long-Range Reliability**
  Up to 1,500 feet range (line of sight). Monitored radio link keeps equipment under control. IR version available.

- **Customizable**
  Transmitter is available with toggle switches, joysticks, potentiometers, paddles, displays, or combinations. Choose the ideal combination of controls for your application.

- **Rugged Construction**
  Environmentally sealed for harsh off-highway applications. Ex rated intrinsically-safe models available.

- **Tether**
  Tether cable allows transmitter to operate without batteries. Also allows transmitter to “learn” receiver address.

- **License Free**
  Pre-certified FCC - no license required.

- **Standard Batteries**
  Operates from standard “D” cell alkaline or rechargeable batteries. No downtime waiting for specialty battery packs to charge. Internal charger option available.

OPERATION

Radio Operation
Models available with outdoor range of 1500 feet or more! Frequency hopping spread spectrum (FHSS) transceiver uses two-way communication for maximum reliability and safety. Operates on 902-928MHz (USA) or 2.4-2.4835GHz (International) unlicensed ISM band. No end-user license required.

Controls
Many combinations of toggle switches, joysticks, potentiometers, paddles, and LCD are possible to customize transmitter functions. Use the product configurator to specify functions and labeling. Every transmitter ships with custom engraved front panel and user specified controls.

Transmitter Matching
Momentarily connecting transmitter to receiver using tether cable allows transmitter to “learn” receiver address. Matching the transmitter to the receiver prevents cross communication in applications where multiple radios are in use. This feature also allows the transmitter to be replaced without changing the receiver.

Batteries
Operates from 3 x “D” cell batteries. Rechargeable types can also be used. Internal battery charger available. Batteries are easily accessible.

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<th>PART #</th>
<th>DESCRIPTION</th>
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<td>TX1</td>
<td>Standard range belly pack transmitter</td>
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<tr>
<td>TE1</td>
<td>Extended range belly pack transmitter</td>
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<tr>
<td>TZ1</td>
<td>International belly pack transmitter</td>
</tr>
<tr>
<td>TR1</td>
<td>Infrared belly pack transmitter</td>
</tr>
</tbody>
</table>

Add “-XL” suffix for jumbo belly pack option.
Add “-EX” suffix for explosion proof version. Consult factory.

**NEW** Improved Design!

- Custom colors available!
- More robust battery compartment with improved sealing
- Hard-wired tether options
- More room for extra functions
## SPECIFICATIONS

### Transmitter

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<th>Specification</th>
<th>Details</th>
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<tr>
<td>Frequency Control</td>
<td>Direct FM</td>
</tr>
<tr>
<td>FCC id</td>
<td>OUR9XCITE: Standard range</td>
</tr>
<tr>
<td></td>
<td>OUR9XTREAM: Extended range</td>
</tr>
<tr>
<td></td>
<td>OURXBEE: International version</td>
</tr>
<tr>
<td>Range (line of sight)</td>
<td>Standard range = 500 feet</td>
</tr>
<tr>
<td></td>
<td>Extended range = 1500 feet</td>
</tr>
<tr>
<td></td>
<td>International = 500 feet</td>
</tr>
<tr>
<td>RF Power Output</td>
<td>Standard range = 5mW</td>
</tr>
<tr>
<td></td>
<td>Extended range = 100mW</td>
</tr>
<tr>
<td></td>
<td>International = 60mW (100mW EIRP)</td>
</tr>
<tr>
<td>Battery Type</td>
<td>3 “D” size alkaline or rechargeable</td>
</tr>
<tr>
<td>Battery Life (Alkaline)</td>
<td>Standard range = Standby, 80 hrs; Transmit, 35 hrs</td>
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<td>Extended range = Standby, 20 hrs; Transmit, 8 hrs</td>
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<td>International = Standby, 15 hrs; Transmit, 6 hrs</td>
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<tr>
<td>Controls</td>
<td>User specified toggles, joysticks, potentiometers, or paddles</td>
</tr>
<tr>
<td>Led Indicator</td>
<td>Flashing = normal; Double blink = battery low</td>
</tr>
</tbody>
</table>

### Enclosure

- **Belly Pack**: High-impact polystyrene, UL94HB
- **Standard**: 7-3/4” L x 5-1/4”W x 6-1/2”D
- **Jumbo**: 11-1/4” L x 5-1/2”W x 6-1/2”D

### Environmental:

- **Storage**: -40°C to 85°C
- **Operating (Standard)**: -25°C to 70°C
- **Operating (EX rated models)**: -40°C to 85°C
- **Battery operating range**: Alkaline (Duracell), -20°C to 54°C
- **NiMH (Powerizer)**: -30°C to 60°C
- **Lithium Thionyl Chloride Primary (Powerizer)**: -55°C to 85°C

## APPLICATIONS

- Oil field
- Mining
- Marine
- Track vehicles
- Wood chippers and grinders
- Crane control
- Sawmill machines
- Rock crushers
- Winch systems
- Specialty off-highway equipment

Our T-1 is the standard for heavy duty equipment.
T-2 Multi-Function Compact Console Transmitter

Fully Customizable Controls

FEATURES

- **Long-Range Reliability**
  Up to 1,500 feet+ range (line of sight). Monitored radio link keeps equipment under control.

- **Customizable**
  Transmitter is available with toggle switches, potentiometers, miniature joysticks and sliders, and LCD display. Choose the ideal combination of controls for your application.

- **Rugged and Compact**
  Compact size for handheld operation. Includes waist and neck straps for added comfort. Environmentally sealed for harsh DC mobile applications.

- **Tether (Option)**
  Tether cable allows transmitter to operate without batteries. Also allows transmitter to “learn” receiver address.

- **License Free**
  Pre-certified FCC - no license required.

- **Standard Batteries**
  Operates from standard “AA” cell alkaline or rechargeable batteries. No downtime waiting for specialty battery packs to charge.

APPLICATIONS

- Track vehicles
- Wood chippers and grinders
- Crane control
- Sawmill machines
- Conveyors
- Earth compactors
- Rock crushers
- Robotics
- Remote process control
- Winch systems
- Specialty off-highway equipment

OPERATION

Radio Operation

Models available with outdoor range of 1500 feet or more! Frequency hopping spread spectrum (FHSS) transceiver uses two-way communication for maximum reliability and safety. Operates on 902-928MHz (USA) or 2.4-2.4835GHz (International) unlicensed ISM band. No end-user license required.

Controls

Compact transmitter can be configured with toggle switches, potentiometers, micro-joysticks and slider modules, and even an LCD display. Use the product configurator to specify functions and labeling. Every transmitter ships with custom engraved front panel.

Transmitter Matching

Transmitters are matched to a receiver by pressing the learn button on the receiver, or momentarily connecting the transmitter to the receiver using the tether cable (if equipped.) Matching the transmitter to the receiver prevents cross communication in applications where multiple radios are in use. This feature also allows the transmitter to be replaced without changing the receiver.

Batteries

Operates from 4 standard “AA” cell batteries. Rechargeable types can also be used. Batteries are easily accessible.

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<tr>
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<tbody>
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<td>TX2</td>
<td>Standard range compact console transmitter</td>
</tr>
<tr>
<td>TE2</td>
<td>Extended range compact console transmitter</td>
</tr>
<tr>
<td>TZ2</td>
<td>International compact console transmitter</td>
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</tbody>
</table>
SPECIFICATIONS

**Transmitter**

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<tr>
<th>Frequency</th>
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</tr>
<tr>
<td></td>
<td>International = 60mW (100mW EIRP)</td>
</tr>
<tr>
<td>Battery Type</td>
<td>4 “AA” size alkaline or rechargeable</td>
</tr>
<tr>
<td>Battery Life (fully charged)</td>
<td>Standard range = Standby, 40 hrs; Transmit, 16 hrs</td>
</tr>
<tr>
<td></td>
<td>Extended range = Standby, 10 hrs; Transmit, 4 hrs</td>
</tr>
<tr>
<td></td>
<td>International = Standby, 8 hrs; Transmit, 3 hrs</td>
</tr>
<tr>
<td>Controls</td>
<td>User specified toggles, potentiometers, mini-joystick/sliders, LCD</td>
</tr>
<tr>
<td>Led Indicator</td>
<td>Flashing = normal; Double blink = battery low</td>
</tr>
<tr>
<td>Enclosure</td>
<td>High-impact ABS</td>
</tr>
<tr>
<td>Environmental</td>
<td>IP65</td>
</tr>
</tbody>
</table>

**Enclosure**

- Compact Console: High-impact ABS
- Approximate size: 7” L x 3-1/2”W x 4-1/4”D including rails

**Environmental**

- Storage: -40ºC to 85ºC
- Operating: -10ºC to 60ºC

Compact console includes waist and neck straps.

Sealed battery compartment is easily accessible.

Control a chipper or crusher from the cab of the loader.
Toggle Switches, Pushbuttons, and Proportional Trigger Option

FEATURES

- Long-Range Reliability
  Up to 1,500 feet+ range (line of sight). Monitored radio link keeps equipment under control.

- Proportional Trigger
  Non-contact proportional trigger delivers smooth control, long life, and environmental sealing.

- Reverse Button
  Optional thumb-operated button reverses trigger direction control for added convenience. Ideal for cranes, or other directional control applications.

- Tether (Option)
  Tether cable allows transmitter to operate without batteries. Also allows transmitter to “learn” receiver address.

- License Free
  Pre-certified FCC - no license required.

- Standard Batteries
  Operates from standard “AA” or “AAA” cell alkaline or rechargeable batteries. No downtime waiting for specialty battery packs to charge.

APPLICATIONS

- Crane control
- Boat davits
- Winches
- Concrete pumps
- Leveling systems
- Robotics
- Remote process control
- Specialty off-highway equipment

OPERATION

Radio Operation
Models available with outdoor range of 1500 feet or more! Frequency hopping spread spectrum (FHSS) transceiver uses two-way communication for maximum reliability and safety. Operates on 902-928MHz (USA) or 2.4-2.4835GHz (International) unlicensed ISM band. No end-user license required.

Controls
Compact handheld transmitter features sealed toggle switches and optional proportional trigger. Use the product configurator to specify functions and labeling. Every transmitter ships with custom engraved front panel.

Transmitter Matching
Transmitters are matched to a receiver by pressing the learn button on the receiver, or momentarily connecting the transmitter to the receiver using the tether cable (if equipped.) Matching the transmitter to the receiver prevents cross communication in applications where multiple radios are in use. This feature also allows the transmitter to be replaced without changing the receiver.

Batteries
Operates from 3 standard “AA” cell batteries. Long range models operate from 4 “AAA” cell batteries. Rechargeable types can also be used. Batteries are easily accessible.

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<table>
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<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>TX3</td>
<td>Standard range hand grip transmitter</td>
</tr>
<tr>
<td>TE3</td>
<td>Extended range hand grip transmitter</td>
</tr>
<tr>
<td>TZ3</td>
<td>International hand grip transmitter</td>
</tr>
</tbody>
</table>

Add “-TR” suffix for proportional trigger option.
## SPECIFICATIONS

### Transmitter

<table>
<thead>
<tr>
<th>Frequency</th>
<th>902-928MHz, Unlicensed ISM band standard models</th>
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<tr>
<td>Type</td>
<td>Frequency hopping spread spectrum</td>
</tr>
<tr>
<td>Frequency Control</td>
<td>Direct FM</td>
</tr>
<tr>
<td>FCC id</td>
<td>OUR9XCITE: Standard range</td>
</tr>
<tr>
<td></td>
<td>OUR9XTREAM: Extended range</td>
</tr>
<tr>
<td></td>
<td>OURXBEE: International version</td>
</tr>
<tr>
<td>Range (line of sight)</td>
<td>Standard range = 500 feet</td>
</tr>
<tr>
<td></td>
<td>Extended range = 1500 feet</td>
</tr>
<tr>
<td></td>
<td>International = 500 feet</td>
</tr>
<tr>
<td>RF Power Output</td>
<td>Standard range = 5mW</td>
</tr>
<tr>
<td></td>
<td>Extended range = 100mW</td>
</tr>
<tr>
<td></td>
<td>International = 60mW (100mW EIRP)</td>
</tr>
<tr>
<td>Battery Type</td>
<td>3 “AA” alkaline or rechargeable (4 “AAA” for TE3)</td>
</tr>
<tr>
<td>Battery Life (fully charged)</td>
<td>Standard range = Standby, 40 hrs; Transmit, 16 hrs</td>
</tr>
<tr>
<td></td>
<td>Extended range = Standby, 10 hrs; Transmit, 4 hrs</td>
</tr>
<tr>
<td></td>
<td>International = Standby, 8 hrs; Transmit, 3 hrs</td>
</tr>
<tr>
<td>Controls</td>
<td>User specified toggles, pushbuttons, potentiometers, trigger</td>
</tr>
<tr>
<td>Trigger (option)</td>
<td>Non contact GMR type</td>
</tr>
<tr>
<td>Led Indicator</td>
<td>Flashing = normal; Double blink = battery low</td>
</tr>
<tr>
<td>Hand Grip</td>
<td>High-impact polystyrene, UL94HB</td>
</tr>
<tr>
<td>Sealing</td>
<td>IP54 up to IP65</td>
</tr>
</tbody>
</table>

### Enclosure

Approximate size: 8” L (inc’l handle) x 4-1/2”W x 4”D

### Environmental

| Storage | -40ºC to 85ºC |
| Operating | -10ºC to 60ºC |

Optional trigger provides smooth proportional control.

Compact hand-grip is comfortable to hold and operate.

Great for davits and cranes.
T–4 Multi-Function Ergo Transmitter

Toggle Switches, Pushbuttons, and Potentiometers

OPERATION

Radio Operation
Models available with outdoor range of 1500 feet or more! Frequency hopping spread spectrum (FHSS) transceiver uses two-way communication for maximum reliability and safety. Operates on 902-928MHz (USA) or 2.4-2.4835GHz (International) unlicensed ISM band. No end-user license required.

Controls
Many combinations of toggle switches, pushbuttons, and LEDs possible to customize transmitter functions. Use the product configurator to specify functions and labeling. Every transmitter ships with custom engraved front panel and user specified controls.

Transmitter Matching
Transmitters are matched to a receiver by pressing the learn button on the receiver. Matching the transmitter to the receiver prevents cross communication in applications where multiple radios are in use. This feature also allows the transmitter to be replaced without changing the receiver.

Batteries
Operates from 4 standard “AA” cell batteries. Rechargeable types can also be used. Batteries are easily accessible.

FEATURES

- **Long-Range Reliability**
  Up to 1,500 feet+ range (line of sight). Monitored radio link keeps equipment under control.

- **Compact Size**
  Compact, ergonomic package is easily worn on arm or clipped to a belt.

- **Rugged Construction**
  Environmentally sealed for harsh DC mobile applications.

- **License Free**
  Pre-certified FCC - no license required.

- **Standard Batteries**
  Operates from standard “AA” cell alkaline or rechargeable batteries. No downtime waiting for specialty battery packs to charge.

APPLICATIONS

- **Blower trucks**
- **Wood chippers and grinders**
- **Crane control**
- **Sawmill machines**
- **Conveyors**
- **Earth compactors**
- **Rock crushers**
- **Robotics**
- **Remote process control**
- **Winch systems**
- **Specialty off-highway equipment**

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX4</td>
<td>Standard range ergo transmitter</td>
</tr>
<tr>
<td>TE4</td>
<td>Extended range ergo transmitter</td>
</tr>
<tr>
<td>TZ4</td>
<td>International ergo transmitter</td>
</tr>
</tbody>
</table>
# SPECIFICATIONS

## Transmitter

<table>
<thead>
<tr>
<th>Feature</th>
<th>Standard Models</th>
<th>International Option</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td>902-928MHz, Unlicensed ISM band</td>
<td>2.4-2.4835GHz, Unlicensed ISM band</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Frequency hopping spread spectrum</td>
<td></td>
</tr>
<tr>
<td><strong>Frequency Control</strong></td>
<td>Direct FM</td>
<td></td>
</tr>
<tr>
<td><strong>FCC id</strong></td>
<td>OUR9XCITE: Standard range</td>
<td>OUR9XTREAM: Extended range</td>
</tr>
<tr>
<td></td>
<td>OURXBEE: International version</td>
<td></td>
</tr>
<tr>
<td><strong>Range (line of sight)</strong></td>
<td>Standard range = 500 feet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extended range = 1500 feet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International = 500 feet</td>
<td></td>
</tr>
<tr>
<td><strong>RF Power Output</strong></td>
<td>Standard range = 5mW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extended range = 100mW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International = 60mW (100mW EIRP)</td>
<td></td>
</tr>
<tr>
<td><strong>Battery Type</strong></td>
<td>4 “AA” size alkaline or rechargeable</td>
<td></td>
</tr>
<tr>
<td><strong>Battery Life (fully charged)</strong></td>
<td>Standard range = Standby, 40 hrs; Transmit, 16 hrs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extended range = Standby, 10 hrs; Transmit, 4 hrs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International = Standby, 8 hrs; Transmit, 5 hrs</td>
<td></td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td>User specified toggles, pushbuttons, or potentiometers</td>
<td></td>
</tr>
<tr>
<td><strong>Led Indicator</strong></td>
<td>Flashing = normal; Double blink = battery low</td>
<td></td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>Ergo arm/waist pack</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High-impact polystyrene, UL94HB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approximate size: 6” L x 4”W x 2”D</td>
<td></td>
</tr>
<tr>
<td><strong>Sealing</strong></td>
<td>IP54</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Storage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-40ºC to 85ºC</td>
<td></td>
</tr>
<tr>
<td><strong>Operating</strong></td>
<td>-10ºC to 60ºC</td>
<td></td>
</tr>
</tbody>
</table>

## Enclosure

- Optional external antenna for added range.
- Optional belt clip.

Optional belt clip.

Great for bark blower trucks.
**T–5 Compact Keypad Remote Controls**

*Up to 16 Functions with Alt Key*

**FEATURES**

- **Custom Keypad**
  Standard model includes custom keypad printed specifically for your application. Full color text, graphics, and logo.

- **Low Cost**
  Economical way to add radio control capability to a wide range of equipment.

- **License Free**
  Pre-certified FCC - no license required.

**ACCESSORIES**

- Weather resistant bag with wrist strap
- Belt clip
- Rubber protective boot

**APPLICATIONS**

- Tow trucks
- Hydraulic equipment
- Winches
- Concrete pumps
- Conveyors
- Earth compactors
- Rock crushers
- Robotics
- Remote process control
- Cranes
- Specialty off-highway equipment

**OPERATION**

*Radio Operation*

TZ5 incorporates a long range 2.4GHz FHSS radio for up to 300 feet range outdoor line of sight.

TF5 and TF5-SM operate on 433MHz for up to 100 feet range outdoor line of sight.

*Controls*

Custom printed keypad features customer-specified labeling including symbols, logos, and color choice.

*Batteries*

TZ5 and TF5 operates from a 9-volt battery in an easily accessible compartment.

TF5 small operates from a pair of standard “AAA” cell batteries installed internally (housing disassembly required.)

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZ5</td>
<td>2.4GHz FHSS keypad transmitter, 300’ range</td>
</tr>
<tr>
<td>TF5</td>
<td>433MHz keypad transmitter, 100’ range</td>
</tr>
<tr>
<td>TF5-SM</td>
<td>Small size 433MHz keypad transmitter, 100’ range</td>
</tr>
</tbody>
</table>
# SPECIFICATIONS

## Transmitter

<table>
<thead>
<tr>
<th>Feature</th>
<th>TZ5: 2.4-2.4835GHz, Unlicensed ISM band</th>
<th>TF5/TF5-SM: 433MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>TZ5: 2.4-2.4835GHz, Unlicensed ISM band</td>
<td>TF5/TF5-SM: 433MHz</td>
</tr>
<tr>
<td>Modulation</td>
<td>TZ5: ZigBee™ 802.15.4</td>
<td>TF5/TF5-SM: ASK/OOK</td>
</tr>
<tr>
<td>Range</td>
<td>TZ5: 300’ line of sight</td>
<td>TF5/TF5-SM: 100’ line of sight</td>
</tr>
<tr>
<td>RF Power Output</td>
<td>TZ5 = 60mW, nominal</td>
<td>TF5/TF5-SM = 1mW</td>
</tr>
<tr>
<td>Battery Type</td>
<td>TZ5/TF5: 9-volt alkaline</td>
<td>TF5-SM: 2 “AAA” alkaline</td>
</tr>
<tr>
<td>Led Indicator</td>
<td>Flashing or Solid (application specific) = normal</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>TZ5/TF5: 5.5” x 2.5” x 1.2”</td>
<td>TF5-SM: 3.78” x 1.85” x 0.95”</td>
</tr>
</tbody>
</table>

## Enclosure

<table>
<thead>
<tr>
<th>Feature</th>
<th>TZ5/TF5: 5.5” x 2.5” x 1.2”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>TF5-SM: 3.78” x 1.85” x 0.95”</td>
</tr>
</tbody>
</table>

## Environmental

<table>
<thead>
<tr>
<th>Feature</th>
<th>TZ5/TF5: 5.5” x 2.5” x 1.2”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>-40°C to 85°C</td>
</tr>
<tr>
<td>Operating</td>
<td>-10°C to 60°C</td>
</tr>
</tbody>
</table>

Compact, handheld keypad transmitter is ideal for cost-sensitive applications!
T–6 Compact Keypad Remote Controls

Up to 16 Functions with Alt Key

FEATURES

- **Long-Range Reliability**
  Up to 500 feet range (line of sight). Monitored radio link keeps equipment under control.

- **Large LCD Display**
  Large, easy to read LCD is factory programmed to display customer parameters such as RPM, pressure, temperature, or other status messages.

- **Ergonomic**
  Comfortable to hold in one hand. Available with wrist strap or magnetic mount.

- **Rugged Construction**
  Environmentally sealed for harsh applications.

- **License Free**
  Pre-certified FCC - no license required.

- **Standard Batteries**
  Operates from standard "AA" cell alkaline or rechargeable batteries. No downtime waiting for specialty battery packs to charge.

APPLICATIONS

- Wood chippers and grinders
- Crane control
- Sawmill machines
- Conveyors
- Earth compactors
- Rock crushers
- Robotics
- Remote process control
- Specialty off-highway equipment

OPERATION

Radio Operation

Models available with outdoor range of 1500 feet or more! Frequency hopping spread spectrum (FHSS) transceiver uses two-way communication for maximum reliability and safety. Operates on 2.4-2.4835GHz (International) unlicensed ISM band. No end-user license required.

Controls

Up to 10 pushbuttons and a large LCD display. Every transmitter ships with custom engraved front panel and user specified controls.

Transmitter Matching

Transmitters are matched to a receiver by pressing the learn button on the receiver. Matching the transmitter to the receiver prevents cross communication in applications where multiple radios are in use. This feature also allows the transmitter to be replaced without changing the receiver.

Batteries

Operates from 4 standard “AA” cell batteries. Rechargeable types can also be used.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZ6</td>
<td>International handheld display transmitter</td>
</tr>
</tbody>
</table>
## SPECIFICATIONS

### Transmitter

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>2.4-2.4835GHz, Unlicensed ISM band international option</td>
</tr>
<tr>
<td>Type</td>
<td>Frequency hopping spread spectrum</td>
</tr>
<tr>
<td>Modulation</td>
<td>ZigBee™ 802.15.4</td>
</tr>
<tr>
<td>FCC id</td>
<td>OURXBEE</td>
</tr>
<tr>
<td>Range (line of sight)</td>
<td>300-500 feet typical</td>
</tr>
<tr>
<td>RF Power Output</td>
<td>60mW (100mW EIRP)</td>
</tr>
<tr>
<td>Battery Type</td>
<td>4 “AA” size alkaline or rechargeable, internal</td>
</tr>
<tr>
<td>Battery Life (fully charged)</td>
<td>Standby, 8 Hrs; Transmit, 5 hrs</td>
</tr>
<tr>
<td>Controls</td>
<td>Pushbuttons only</td>
</tr>
</tbody>
</table>

### Enclosure

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD Handheld</td>
<td>Polyamide, UL94 V2</td>
</tr>
<tr>
<td>Approximate size</td>
<td>7.36” L x 4.17” W x 1.97” D</td>
</tr>
<tr>
<td>Sealing</td>
<td>IP65</td>
</tr>
</tbody>
</table>

### Environmental

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>-40ºC to 85ºC</td>
</tr>
<tr>
<td>Operating</td>
<td>-10ºC to 60ºC</td>
</tr>
</tbody>
</table>

Optional magnetic clip for hanging or mounting.

Ergonomic. Comfortable to hold in one hand.
T–7 18-Button Rugged Keypad Remote Controls

Up to 32 Functions with Alt Key

FEATURES

- **Rugged**
  Heavy duty reinforced thermoplastic enclosure with metal back plate. Built for heavy use and demanding environments.

- **Custom Keypad**
  Standard model includes custom keypad printed specifically for your application. Full color text, graphics, and logo.

- **Low Cost**
  Economical way to add radio control capability to a wide range of equipment.

- **License Free**
  Pre-certified FCC - no license required.

ACCESSORIES

- **Belt clip (standard)**
- **Tether cable (option)**

APPLICATIONS

- **Tow trucks**
- **Hydraulic equipment**
- **Winches**
- **Cranes**
- **Rock crushers**
- **Concrete pumps**
- **Remote process control**
- **Robotics**
- **Specialty off-highway equipment**

OPERATION

Radio Operation
TZ7 incorporates a long range 2.4GHz FHSS radio for up to 300 feet range outdoor line of sight.
TF7 operates on 433MHz for up to 100 feet range outdoor line of sight.

Controls
Custom printed keypad features customer-specified labeling including symbols, logos, and color choice.

Batteries
TZ7 and TF7 operate from a 9-volt battery in a gasketed compartment.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZ7</td>
<td>2.4GHz FHSS keypad transmitter, 300’ range</td>
</tr>
<tr>
<td>TF7</td>
<td>433MHz keypad transmitter, 100’ range</td>
</tr>
</tbody>
</table>

Tether option shown includes 3-meter cable.
## SPECIFICATIONS

### Transmitter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>TZ7: 2.4-2.4835GHz, Unlicensed ISM band</th>
<th>TF7: 433MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>TZ7: 2.4-2.4835GHz, Unlicensed ISM band</td>
<td>TF7: 433MHz</td>
</tr>
<tr>
<td>Modulation</td>
<td>TZ7: ZigBee™ 802.15.4</td>
<td>TF7: ASK/OOK</td>
</tr>
<tr>
<td>Range</td>
<td>TZ7: 300’ line of sight</td>
<td>TF7: 100’ line of sight</td>
</tr>
<tr>
<td>RF Power Output</td>
<td>TZ7 = 60mW, nominal</td>
<td>TF7 = 1mW</td>
</tr>
<tr>
<td>Battery Type</td>
<td>TZ7/TF7: 9-volt alkaline</td>
<td></td>
</tr>
<tr>
<td>Led Indicator</td>
<td>Flashing or Solid (application specific) = normal</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>TZ7/TF7: 8.8” x 2.5” x 1.2” (1.5” with belt clip)</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>-40ºC to 85ºC</td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>-10ºC to 60ºC</td>
<td></td>
</tr>
</tbody>
</table>

### Enclosure

- Dimensions: 8.8” x 2.5” x 1.2” (1.5” with belt clip)

### Environmental

- Storage: -40ºC to 85ºC
- Operating: -10ºC to 60ºC

Also available as a hard wired pendant control!

Other pushbutton and toggle switch arrangements are also possible.
FEATURES

- **Simple to Set Up and Use**
  Menu-driven interface on receiver provides simple setup and adjustment of all functions. Documentation provided for wiring.

- **Modular Outputs**
  1 to 32 factory installed outputs can be digital, proportional, ratiometric, or unamplified. Ideal for controlling electrical, hydraulic, and pneumatic equipment.

- **Environmentally Sealed**
  Environmentally sealed to IP67 for harsh environments.

- **License Free**
  Pre-certified FCC - no licence required

- **External Antenna**
  Flexible antenna can be installed away from obstructions to improve range.

- **Connector and Cable Included**
  Receiver features environmentally sealed Deutsch connector with mating connector pigtail cable.

APPLICATIONS

- Track machines
- Wood chippers and grinders
- Crane control
- Sawmill equipment
- Conveyors
- Earth compactors
- Rock crushers
- Robotics
- Remote process control
- Winch systems
- Specialty off-highway equipment

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX1</td>
<td>Standard range universal receiver kit</td>
</tr>
<tr>
<td>RE1</td>
<td>Extended range universal receiver kit</td>
</tr>
<tr>
<td>RZ1</td>
<td>International universal receiver kit</td>
</tr>
</tbody>
</table>
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>General</th>
<th>Power Requirement</th>
<th>10-30vdc, 500mA nominal + power to loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuses</td>
<td>Self-resetting type. Outputs protected</td>
<td></td>
</tr>
<tr>
<td><strong>Radio</strong></td>
<td>Frequency</td>
<td>902-928MHz, Unlicensed ISM band standard models</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.4-2.4835GHz, Unlicensed ISM band international option</td>
</tr>
<tr>
<td>Type</td>
<td>Frequency hopping spread spectrum</td>
<td></td>
</tr>
<tr>
<td>Frequency Control</td>
<td>Direct FM</td>
<td></td>
</tr>
<tr>
<td>FCC id</td>
<td>OUR9XCITE: Standard range</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OUR9XTREAM: Extended range</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OURXBEE: International version</td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>-104dBm</td>
<td></td>
</tr>
<tr>
<td><strong>Receiver</strong></td>
<td>RF Connector</td>
<td>BNC</td>
</tr>
<tr>
<td>Output Types</td>
<td>Digital, proportional, ratiometric, or unamplified</td>
<td></td>
</tr>
<tr>
<td>Digital Outputs</td>
<td>Solid state relay, provides supply voltage up to 5-amp</td>
<td></td>
</tr>
<tr>
<td>Proportional Current Outputs</td>
<td>Adjustable PWM up to 5-amp</td>
<td></td>
</tr>
<tr>
<td>Ratiometric Outputs</td>
<td>25% to 75% of supply voltage, 100mA max</td>
<td></td>
</tr>
<tr>
<td>Unamplified Outputs</td>
<td>Customer specified (0-10v, typical)</td>
<td></td>
</tr>
<tr>
<td>Standard Adjustments</td>
<td>Min, Max, Ramp up, Ramp down, Threshold</td>
<td></td>
</tr>
<tr>
<td>Field Wiring</td>
<td>40-position Deutsch connector with 6’ pigtail wiring</td>
<td></td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>Keypad</td>
<td>8-pushbuttons</td>
</tr>
<tr>
<td></td>
<td>LCD</td>
<td>4-line x 16 character backlit LCD</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td></td>
<td>IP67 fiberglass</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Storage</td>
<td>-40°C to 85°C</td>
</tr>
<tr>
<td></td>
<td>Operating</td>
<td>-10°C to 60°C</td>
</tr>
</tbody>
</table>

*Built-in programming interface. Ideal for fine tuning machining performance!*
R-2  1 to 32 Channel Receiver

Cost-effective factory preset version of our flagship R-1!

FEATURES

- **Modular Outputs**
  1 to 32 factory installed outputs can be digital, proportional, ratiometric, or unamplified. Ideal for controlling electrical, hydraulic, and pneumatic equipment.

- **Environmentally Sealed**
  Environmentally sealed to IP67 for harsh environments.

- **License Free**
  Pre-certified FCC - no licence required

- **External Antenna**
  Flexible antenna can be installed away from obstructions to improve range.

- **Connector and Cable Included**
  Receiver features environmentally sealed Deutsch connector with mating connector pigtail cable.

- **OEM programming tool (option)**
  Programming tool available for fine-tuning machine performance.

OPERATION

**Radio Operation**
Up to 32 factory installed outputs can be any combination of digital (bang/bang), proportional current, ratiometric, or unamplified. Can directly drive a wide range of coils and other DC loads.

**Factory configurable**
Optional programming tool allows OEM’s to make adjustments to fine-tune machine performance.

**Programmable Logic**
Receiver can be factory programmed to perform a wide range of logical functions and sequences.

**Pushbutton/Tether Learn**
Transmitter and receiver are “married” to permit operation of multiple radios in the same area without cross-control. Transmitters and receivers can be married in the field by pushing a button in the receiver or momentarily connecting the optional tether cable.

**Safety Features**
Receiver automatically detects when transmitter is out of range, and returns outputs to a safe condition. Normally closed E-Stop output also available. Monitored receiver electronics disables outputs on fault condition.

APPLICATIONS

- Track machines
- Wood chippers and grinders
- Crane control
- Sawmill equipment
- Conveyors
- Earth compactors
- Rock crushers
- Robotics
- Remote process control
- Winch systems
- Specialty off-highway equipment

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX2</td>
<td>Standard range universal receiver kit</td>
</tr>
<tr>
<td>RE2</td>
<td>Extended range universal receiver kit</td>
</tr>
<tr>
<td>RZ2</td>
<td>International universal receiver kit</td>
</tr>
</tbody>
</table>
## SPECIFICATIONS

### General
- **Power Requirement**: 10-30vdc, 500mA nominal + power to loads
- **Fuses**: Self-resetting type. Outputs protected

### Radio
- **Frequency**: 902-928MHz, Unlicensed ISM band standard models
  - 2.4-2.4835GHz, Unlicensed ISM band international option
- **Type**: Frequency hopping spread spectrum
- **Frequency Control**: Direct FM
- **FCC id**: OUR9XCITE: Standard range
  - OUR9XTREAM: Extended range
  - OURXBEE: International version
- **Sensitivity**: -104dBm

### Receiver
- **RF Connector**: BNC
- **Output Types**: Digital, proportional, ratiometric, or unamplified
  - **Digital Outputs**: Solid state relay, provides supply voltage up to 5-amp
  - **Proportional Current Outputs**: Adjustable PWM up to 5-amp
  - **Ratiometric Outputs**: 25% to 75% of supply voltage, 100mA max
  - **Unamplified Outputs**: Customer specified (0-10v, typical)
- **Field Wiring**: 40-position Deutsch connector with 6’ pigtail wiring

### Enclosure
- **Environmental**
  - **Storage**: -40ºC to 85ºC
  - **Operating**: -10ºC to 60ºC
  - **Enclosure**: IP67 fiberglass

Optional programming tool allows OEM’s to fine-tune receiver performance.

Note: Must be ordered with R-2 receiver to ensure compatible receiver programming.
R–3 14 or 28 Channel Relay Receiver

Relay Outputs, with Cable and External Antenna

**FEATURES**

- **Simple to Set Up and Use**
  Relay outputs pre-wired to connector. Mating connector pigtail provided for easy field wiring.

- **Environmentally Sealed**
  Environmentally sealed to NEMA 4 for harsh environments.

- **License Free**
  Pre-certified FCC - no licence required

- **External Antenna**
  Flexible antenna can be installed away from obstructions to improve range.

- **Connector and Cable Included**
  Receiver features environmentally sealed Deutsch HD connector with mating connector pigtail cable.

**OPERATION**

**Radio Operation**

14 or 28 relay outputs, and 2 proportional outputs can directly drive up to 5-amp loads.

**Pushbutton/Tether Learn**

Transmitter and receiver are “married” to permit operation of multiple radios in the same area without cross-control. Transmitters and receivers can be married in the field by pushing a button in the receiver or momentarily connecting the optional tether cable.

**Safety Features**

Receiver automatically detects when transmitter is out of range, and returns outputs to a safe condition. Normally-closed E-Stop output also available. Monitored receiver electronics disables outputs on fault condition.

**APPLICATIONS**

- Rock crushers
- Wood chippers and grinders
- Crane control
- Sawmill machines
- Conveyors
- Earth compactors
- Blower trucks
- Robotics
- Remote process control
- Winch systems
- Specialty off-highway equipment

NEMA 4X polycarbonate option shown

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX3</td>
<td>Standard range relay receiver</td>
</tr>
<tr>
<td>RE3</td>
<td>Extended range relay receiver</td>
</tr>
<tr>
<td>RZ3</td>
<td>International relay receiver</td>
</tr>
</tbody>
</table>

Add “-28” suffix for 28-relay version.
### SPECIFICATIONS

#### General
- **Power Requirement**: 10 to 30vdc, 500mA nominal + power to loads
- **Fuses**: 15 amp standard blade. Outputs protected

#### Radio
- **Frequency**: 902-928MHz, Unlicensed ISM band standard models
- **Type**: Frequency hopping spread spectrum
- **Frequency Control**: Direct FM
- **FCC id**: OUR9XCITE: Standard range
  - OUR9XTREAM: Extended range
  - OURXBEE: International version

#### Receiver
- **Sensitivity**: -104dBm
- **RF Connector**: BNC
- **Relays**: 14 or 28 x 5-amp contacts, DC only
- **Proportional Current Outputs**: 2 x PWM up to 5-amp
- **Field Wiring**: 29-pin Deutsch HD connector with mating 6’ pigtail cable

#### Enclosure
- **Enclosure**: NEMA 4, powder coated steel
- **NEMA 4X polycarbonate available**
- **Approximate size**: 9” L x 6”W x 4”D

#### Environmental
- **Storage**: -40°C to 85°C
- **Operating**: -10°C to 60°C

Mechanical relay outputs can be configured for normally open or normally closed operation. Outputs can also be bridged to operate linear actuator motors directly. Also features two PWM outputs for added flexibility.
R–4 1-16 Channel Factory Configurable Receiver

With Connector, Cable and Internal or External Antenna

FEATURES

- **Simple to Set Up and Use**
  Pre-wired cable harness with Deutsch DTM series connector. Factory programmed for your application. Wiring diagram included.

- **Compact, Rugged Enclosure**
  Compact size is ideal for mounting in tight spaces. Environmentally sealed for harsh off-highway applications. IP66 rated enclosure and connector.

- **Affordable**
  Fully integrated receiver. No external modules required. Outputs factory configured for your application. Pay only for the outputs and features you need.

- **License Free**
  Pre-certified FCC - no license required.

- **External Antenna (Option)**
  Flexible antenna can be installed away from obstructions to improve range.

OPERATION

**Radio Operation**
Up to 16 factory installed outputs can be any combination of digital (bang/bang), proportional current, ratiometric, or unamplified. Can directly drive a wide range of coils and other DC loads.

Up to 7 of the available output channels may be configured as inputs with popular voltage ranges suitable for reading sensors or switches.

**Programmable Logic**
Receiver can be factory programmed to perform a wide range of logical functions and sequences.

**Pushbutton/Tether Learn**
Transmitter and receiver are “married” to permit operation of multiple radios in the same area without cross-control. Transmitters and receivers can be married in the field by pushing a button in the receiver or momentarily connecting the optional tether cable.

**Safety Features**
Receiver automatically detects when transmitter is out of range, and returns outputs to a safe condition. Normally-closed E-Stop output also available. Monitored receiver electronics disables outputs on fault condition.

APPLICATIONS

- **Crane control**
- **Wood chippers and grinders**
- **Blower trucks**
- **Sawmill machines**
- **Conveyors**
- **Earth compactors**
- **Rock crushers**
- **Robotics**
- **Remote process control**
- **Winch systems**
- **Specialty off-highway equipment**

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX4</td>
<td>Standard range 16 channel receiver</td>
</tr>
<tr>
<td>RE4</td>
<td>Extended range 16 channel receiver</td>
</tr>
<tr>
<td>RZ4</td>
<td>International 16 channel receiver</td>
</tr>
</tbody>
</table>
SPECIFICATIONS

General
- Power Requirement: 10 to 30vdc, 500mA nominal + power to loads
- Fuses: 10-amp inline mini blade fuse. Outputs protected

Radio
- Frequency: 902-928MHz, Unlicensed ISM band standard models
  2.4-2.4835GHz, Unlicensed ISM band international option
- Type: Frequency hopping spread spectrum
- Frequency Control: Direct FM
- FCC id:
  - OUR9XCITE: Standard range
  - OUR9XTREAM: Extended range
  - OURXBEE: International version
- Sensitivity: -104dBm

Receiver
- RF Connector (option): BNC
- Output Types: Digital, proportional, ratiometric, or unamplified
- Digital Outputs: Solid state relay, provides supply voltage up to 5-amp
- Proportional Current Outputs: Adjustable PWM up to 5-amp
- Ratiometric Outputs: 25% to 75% of supply voltage, 100mA max
- Unamplified Outputs: Customer specified (0 to 10v, typical)
- Inputs: Up to 7 factory configurable inputs, 55vdc max.
- Field Wiring: 1 or 2, 12-pin DTM connector with 6’ pigtail cable

Enclosure
- Nylon 6/6 black, IP66
- Approximate size: 5.24" L x 4.63"W x 1.48"D

Environmental
- Storage: -40ºC to 85ºC
- Operating: -10ºC to 60ºC

Up to 16 factory configurable outputs in a rugged, compact, and water tight enclosure.
R–4-CAN  CAN Compatible Receiver

With Connector, Cable, and Internal or External Antenna

FEATURES

- Reduced Wiring
  CAN compatibility greatly reduces wiring by eliminating individual output connections.

- Compact, Rugged Enclosure
  Compact size is ideal for mounting in tight spaces. Environmentally sealed for harsh off-highway applications. IP66 rated enclosure and connector.

- Affordable
  Fully integrated receiver. No external modules required. Factory configured to interface with popular CAN controllers.

- Flexible I/O
  2 x J1939 CAN ports, 1 x RS485 port for tether control, and 2 x proportional outputs configurable for PWM, digital (bang/bang), ratiometric voltage, or 0-5vdc.

- License Free
  Pre-certified FCC - no license required.

- External Antenna (Option)
  Flexible antenna can be installed away from obstructions to improve range.

OPERATION

CAN Output
SAE J1939 compatible. Consult factory for specific protocols, address and data rate information.

Programmable Logic
Receiver can be factory programmed to perform a wide range of logical functions and sequences.

Pushbutton/Tether Learn
Transmitter and receiver are “married” to permit operation of multiple radios in the same area without cross-control. Transmitters and receivers can be married in the field by pushing a button in the receiver or momentarily connecting the optional tether cable.

Safety Features
Receiver provides a “heartbeat” output 20 times per second. Controller should be programmed to monitor this output to detect fault conditions.

APPLICATIONS

- Remote process control
- Specialty off-highway equipment
- Crane control
- Sawmill machines
- Conveyors
- Earth compactors
- Rock crushers
- Robotics
- Wood chippers and grinders
- Winch systems

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX4-CAN</td>
<td>Standard range CAN receiver</td>
</tr>
<tr>
<td>RE4-CAN</td>
<td>Extended range CAN receiver</td>
</tr>
<tr>
<td>RZ4-CAN</td>
<td>International CAN receiver</td>
</tr>
</tbody>
</table>

Shown with optional tether connector and external antenna jack
## SPECIFICATIONS

### General
- **Power Requirement**: 10 to 30vdc, 500mA max
- **Fuses**: Internal 1-amp self-resetting fuse

### Radio
- **Frequency**: 902-928MHz, Unlicensed ISM band standard models
  2.4-2.4835GHz, Unlicensed ISM band international option
- **Type**: Frequency hopping spread spectrum
- **Frequency Control**: Direct FM
- **FCC id**: OUR9XCITE: Standard range
  OUR9XTREAM: Extended range
  OURXBEE: International version
- **Sensitivity**: -104dBm

### Receiver
- **RF Connector (option)**: BNC
- **Communication**: CAN, SAE J1939; 2 ports
  RS485; Tether control
  Consult factory for available protocols and message specifics
- **Field Wiring**: 12-pin DTM connector with 4-conductor, 6’ pigtail cable

### Enclosure
- **Nylon 6/6 black, IP66**
- **Approximate size**: 5.24” L x 4.63” W x 1.48” D

### Environmental
- **Storage**: -40ºC to 85ºC
- **Operating**: -10ºC to 60ºC

### POINT MAP
- **Address**: 11 or 29 bits factory set - consult factory for specific requirements
- **Data Rate**: 250kbps; update 20 times per second

### WIRING
![Wiring Diagram]

- **CAN-HI**
- **CAN-LO**
- **WHITE**
- **GREEN**
- **RED**
- **BLACK**
- **GROUND**
- **POWER**
R–5 / R-5-24 16 and 24 Channel Basic Receiver

Up to 16 or 24 Functions Latching or Momentary

FEATURES

- **Low Cost**
  Economical way to add radio control capability to a wide range of equipment.

- **Compact Size**
  Mounts in tight locations.

- **Easy Installation**
  Terminal blocks are easily accessible for simple, clean installation.

- **License Free**
  Pre-certified FCC - no license required.

OPERATION

Radio Operation

Up to 16 or 24 solid state 10-amp outputs can be factory programmed for latching or momentary operation. Special functions can be programmed into the receiver for specialized applications.

Pushbutton Learn

Transmitter and receiver are “married” to permit operation of multiple radios in the same area without interference or cross-control. Transmitters and receivers can be married in the field by pushing a button in the receiver.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RZ5</td>
<td>2.4GHz receiver, 16 channel</td>
</tr>
<tr>
<td>RF5</td>
<td>433MHz receiver, 16 channel</td>
</tr>
<tr>
<td>RZ5-24</td>
<td>2.4GHz receiver, 24 channel</td>
</tr>
<tr>
<td>RF5-24</td>
<td>433MHz receiver, 24 channel</td>
</tr>
</tbody>
</table>

SPECIFICATIONS

<table>
<thead>
<tr>
<th>General</th>
<th>Power Requirement</th>
<th>12vdc, 100mA nominal + power to loads 24vdc version available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuses</td>
<td></td>
<td>10-amp mini blade fuse</td>
</tr>
</tbody>
</table>

Radio

<table>
<thead>
<tr>
<th>Frequency</th>
<th>RZ5: 2.4-2.4835GHz, Unlicensed ISM band international option</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RFS: 433MHz, fixed frequency</td>
</tr>
</tbody>
</table>

| RF Connector (option)          | BNC                                                          |
| Outputs                        | Up to 16 or 24 Solid state 10-amp sourcing                  |
| Field Wiring                   | Internal, eurostyle cage clamp terminals                     |
|                                 | Water resistant cable gland for wire entry                   |
|                                 | Jacketed cable recommended                                  |

Enclosure

|                                 | ABS, NEMA 4X                                                |
|                                 | Approximate size (R-5): 4.53”L (+1.2” cable gland) x 3.54”W x 2.17”D |
|                                 | Approximate size (R-5-24): 6.75”L (+1.2” cable gland) x 4.75”W x 2.17”D |

Environmental

| Storage                         | -40°C to 85°C                                               |
| Operating                       | -40°C to 60°C                                               |
FEATURES
- **Low Cost**
  Economical way to add radio control capability to a wide range of equipment.
- **Rugged and Compact**
  Potted module mounts in tight locations.
- **Easy Installation**
  Deutsch connector for simple, clean installation.
- **License Free**
  Pre-certified FCC - no license required.

OPERATION

**Radio Operation**
Models with up to 7 solid state 10-amp outputs. Special functions can be programmed into the receiver for specialized applications.

**Learn Mode**
Receiver can “learn” a new transmitter in the field by operating 2 transmitter functions simultaneously within 3 seconds of powering receiver on.

SPECIFICATIONS

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF6-SM</td>
<td>433MHz potted receiver, 1, 2, or 3 channels</td>
</tr>
<tr>
<td>RF6</td>
<td>433MHz potted receiver, 4, 5, 6, or 7 channels</td>
</tr>
</tbody>
</table>

ORDERING INFORMATION

**General**
- **Power Requirement**
  12vdc, 100mA nominal + power to loads
- **Fuses**
  Customer-supplied fuse should be installed in field wiring

**Radio**
- **Frequency**
  433MHz, fixed frequency
- **RF Connector (option)**
  BNC
- **Outputs**
  RF6-SM; Up to 3 Solid state 10-amp sourcing
  RF6; Up to 7 Solid state 10-amp sourcing
- **Field Wiring**
  RF6-SM; Deutsch DT06-08S plug and contact kit
  RF6; Deutsch DT06-12S plug and contact kit
  Crimp contacts provided for 16-18awg stranded wire

**Enclosure**
- **ABS, Potted box, NEMA 4X**
- **Approximate size:**
  RF6-SM: 4.9”L x 2.2”W x 2”H
  RF6: 5.5”L x 3.2”W x 2”H

**Environmental**
- **Storage**
  -40°C to 85°C
- **Operating**
  -10°C to 60°C
**IRX30 Infrared Receiver Module**

*Converts a Miratron radio receiver into an IR receiver*

**FEATURES**

- **High-Reliability**
  Reliable wireless control - even in noisy radio environments.

- **Controlled Range**
  Operates only from a safely controlled range.

- **Directional**
  Requires operator to be facing equipment for maximum safety.
  360 degree receiver field of view.

- **Wide regulatory acceptance**
  Ideal for use in areas where radio control is not permitted.

**OPERATION**

**Receiver Operation**
Connects directly to the tether jack on our most popular receivers. Compatible with all IR equipped Miratron transmitters.

**APPLICATION**

![Diagram of IRX30 IR Receiver Module and Miratron IR-Equipped Transmitter](image)

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRX30</td>
<td>Infrared receiver module</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>General</th>
<th>Power Requirement</th>
<th>Powered from receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR</td>
<td>Wavelength</td>
<td>950nM infrared</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>50 feet, nominal</td>
</tr>
</tbody>
</table>

| Field Wiring     | Amphenol C-16 series connector, 4-conductor |
|                  | Connects directly to Miratron receiver tether jack |

| Enclosure        | Tinted polycarbonate, NEMA 4X |
|                  | Approximate size: 3.85 diam x 2.3” h above mounting surface |
|                  | 4” recommended under mounting surface for wiring |

| Environmental    | Storage            | -40°C to 85°C |
|                  | Operating          | -40°C to 60°C |
IRX2 2-channel Infrared Receiver

Complete 2-channel IR receiver with optional inputs

FEATURES

- **High-Reliability**
  Reliable wireless control - even in noisy radio environments.

- **Controlled Range**
  Operates only from a safely controlled range.

- **Directional**
  Requires operator to be facing equipment for maximum safety.
  360 degree receiver field of view.

- **Wide regulatory acceptance**
  Ideal for use in areas where radio control is not permitted.

OPERATION

**Receiver Operation**

Complete 2-channel IR receiver. Factory configurable outputs and 2 optional inputs for sensors or local controls. Compatible with all IR equipped Miratron transmitters.

SPECIFICATIONS

**General**

- **Power Requirement**: 12vdc, 50mA nominal + power to loads
- **Fuses**: Customer-supplied fuse should be installed in field wiring

**IR**

- **Wavelength**: 950nM infrared
- **Range**: 50 feet, nominal

**Outputs**

- **2 factory configurable outputs**: Digital, proportional, ratiometric, or unamplified
- **Digital Outputs**: Solid state relay, provides supply voltage up to 5-amp
- **Proportional Current Outputs**: Adjustable PWM up to 5-amp
- **Ratiometric Outputs**: 25% to 75% of supply voltage, 100mA max
- **Unamplified Outputs**: Customer specified (0 to 10v, typical)

**Inputs**

- **2 optional inputs**: Compatible with switches or sensors

**Field Wiring**

- **Wiring pigtail provided**

**Enclosure**

- **Tinted polycarbonate, NEMA 4X**
- **Approximate size**: 3.85 diam x 2.3” h above mounting surface
- **4” recommended under mounting surface for wiring**

**Environmental**

- **Storage**: -40°C to 85°C
- **Operating**: -40°C to 60°C
Expansion Module - Add Up to 16 Additional Outputs to an R-4 Receiver

FEATURES

- **Expanded Functionality**
  Increase the functionality of our popular R-4 receiver by adding up to 16 additional outputs per expansion module.

- **Simple to Set Up and Use**
  Pre-wired cable harness with Deutsch DTM series connector. Factory programmed for your application. Wiring diagram included.

- **Compact, Rugged Enclosure**
  Compact size is ideal for mounting in tight spaces. Environmentally sealed for harsh off-highway applications. IP66 rated enclosure and connector.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-EXP-4</td>
<td>Expansion module with cable</td>
</tr>
</tbody>
</table>

LAM 72x - Controls Linear Actuators from Radio Receiver Outputs

**LAM720**

- **Digital control**
  Accepts two 12-volt input signals (extend and retract) and provides relay switched outputs for 2-wire linear actuator (ex. Addco 720).

**DIMENSIONS**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>4.004</td>
</tr>
<tr>
<td>Length</td>
<td>3.500</td>
</tr>
<tr>
<td>Height</td>
<td>1.000</td>
</tr>
<tr>
<td>Thickness</td>
<td>0.184</td>
</tr>
</tbody>
</table>

**LAM722**

- **Feedback position control**
  For use with linear actuators equipped with feedback potentiometer and clutch (ex. Addco 722).

- **Analog input**
  Accepts 0.5 to 4.5 volt input signal, or 10k potentiometer, and provides proportional position control.

- **Adjustable**
  Adjustable extend, retract, and center positions.

- **LED indicators**
  LEDs provide status and fault indication.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAM720</td>
<td>Bang/bang controller</td>
</tr>
<tr>
<td>LAM722</td>
<td>Proportional position controller with feedback</td>
</tr>
</tbody>
</table>
SPECIAL SERVICES

Extra options available to customize radio control systems

CONTROLS
- Colored pushbuttons
- Pushbutton joysticks
- Tilt sensor
- Rotary encoder wheel, potentiometers, selector switches
- LCD, LED, VF displays
- Miniature joysticks and sliders
- Keyswitches and other custom controls

CABLING
- Custom wire harnesses
- Special wire and cable types
- Connectors installed
- Loom and braid options

PACKAGING
- Custom electronics to fit customer-supplied enclosures
- Enclosures for special applications
- Environmental sealing
- Potting and coating

DECORATION
- Customer logo printing
- Full-color vinyl printing and cutting
- Engraved plastic laminate sheet
- Decorative handles and hardware

PROGRAMMING
- Logic
- Math
- Sequences
- Conditions
- Modes

DESIGN
- Custom product design for qualified applications. Consult factory for more information.
The TZM10/RZM10 is a simple, cost-effective way to add wireless control to almost any equipment.

FEATURES

- **Low Cost**
  Economical way to add radio control capability to a wide range of equipment.

- **Flexible**
  Operates one or two valve coils for speed and direction control.

- **Proportional Control**
  High-resolution solid-state output(s) for fine control of loads up to 5-Amps DC

- **Compact Size**
  Only 1.6” wide - Fits easily in tight spaces.

- **Rugged Construction**
  Robust potted module keeps electronics protected.

- **License Free**
  Pre-certified FCC - no license required.

OPERATION

**Transmitter:**
TZM incorporates a long range 2.4GHz FHSS radio for up to 300 feet range outdoor line of sight.

Excitation voltage output provided (5VDC @ 500mA max) for use with switches, potentiometers, or joysticks.

E-Stop input (EMS) accepts normally closed switch. EMS input must be connected to +5V terminal to enable receiver outputs. Opening EMS connection sends signal to receiver to de-energize outputs.

**Receiver:**
Solid state outputs source up to 5-amps. Proportional PWM current output, or bang-bang operation.

Receiver outputs are de-energized if transmitter signal is lost for more than 1/2 second.

**Learn mode:**
Receiver can “learn” a new transmitter in the field. Consult factory for specific learn procedure.

DIMENSIONS

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZM10</td>
<td>Transmitter module, 2.4GHz, 300 ft. range</td>
</tr>
<tr>
<td>RZM10</td>
<td>Receiver module, 2.4GHz, 300 ft. range</td>
</tr>
</tbody>
</table>
**SPECIFICATIONS**

**Transmitter**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs</td>
<td>2 analog or digital (0-5vdc); 1 E-Stop (EMS)</td>
</tr>
<tr>
<td>Frequency</td>
<td>2.4-2.4835GHz, Unlicensed ISM band</td>
</tr>
<tr>
<td>Modulation</td>
<td>ZigBee™ 802.15.4</td>
</tr>
<tr>
<td>Range</td>
<td>300’ line of sight</td>
</tr>
<tr>
<td>RF Power Output</td>
<td>60mW, nominal</td>
</tr>
<tr>
<td>Power</td>
<td>12VDC, 100mA max.</td>
</tr>
<tr>
<td>Led Indicator</td>
<td>Flashing or Solid (application specific) = normal</td>
</tr>
</tbody>
</table>

**Enclosure**

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS Potted module, 3.0” L x 1.6” W x 1” H</td>
</tr>
</tbody>
</table>

**Environmental**

<table>
<thead>
<tr>
<th>Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage: -40ºC to 85ºC</td>
</tr>
<tr>
<td>Operating: -10ºC to 60ºC</td>
</tr>
</tbody>
</table>

**Receiver**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Requirement</td>
<td>12vdc, 100mA nominal + power to loads</td>
</tr>
<tr>
<td>Fuses</td>
<td>Customer-supplied fuse should be installed in field wiring</td>
</tr>
<tr>
<td>Outputs</td>
<td>2 proportional PWM current (can be used as on/off)</td>
</tr>
<tr>
<td>Dropout delay</td>
<td>1/2 second</td>
</tr>
</tbody>
</table>

**Enclosure**

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS Potted module, 3.0” L x 1.6” W x 1” H</td>
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</table>

**Environmental**

<table>
<thead>
<tr>
<th>Temperature Range</th>
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<tbody>
<tr>
<td>Storage: -40ºC to 85ºC</td>
</tr>
<tr>
<td>Operating: -10ºC to 60ºC</td>
</tr>
</tbody>
</table>

**WIRING**

![Wiring Diagram](attachment:image.png)

- **TZM10**
  - Optional Power Switch
  - 1-AMP Fuse (Recommended)
  - Battery Positive (+)
  - Chassis Ground
  - E-Stop

- **RZM10**
  - Optional Power Switch
  - 10-AMP Fuse (Recommended)
  - Battery Positive (+)
  - Chassis Ground
  - Additional Grounds for wiring convenience
  - Coil 1
MOTOR LINK  Keyfob Remote Motor Controller

Direct remote control of DC gear motor or linear actuator up to 25 amps!

FEATURES

- **Rugged, Compact Receiver**
  Fully encapsulated receiver withstands harsh environments. Small package fits easily in tight spaces.

- **High-Capacity Solid-State Output**
  Directly controls DC gear motors up to 25 amps. 100% solid state output. No mechanical relays to wear out. Controls 2 or 3 wire motors in forward and reverse.

- **Manual Override**
  Terminal provided for manual override switch. Low-power operation compatible with a wide range of low-current single pole switches. Smart override input temporarily overrides radio control for increased safety.

- **Coded Signal**
  Remote signal is coded to prevent unwanted control by other radio transmitters. Receiver can automatically learn new replacement transmitters as needed.

- **Status Indicators**
  LED’s provided for easy setup and troubleshooting.

- **License Free**
  Pre-certified FCC. No end-user license required.

OPERATION

Radio Operation

2 button keyfob controls 2 or 3 wire reversible DC gear motors or linear actuators in both directions.

Manual Override

A single-pole, double-throw (SPDT) switch can be connected to the override input. This input terminal provides a low-power control signal, so the override switch does not switch the full motor current. When the override switch is in use, the radio remote control is temporarily disabled for safety.

Coding

Each system is factory shipped with a unique random radio address to prevent other radio transmitters from causing unwanted operation. The address can be changed in the field, and the receiver can learn a new transmitter address.

APPLICATIONS

- Electric gates
- Roll-up doors
- Tarpers
- Linear actuator motors

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML433-KF2</td>
<td>Keyfob transmitter, 2-button</td>
</tr>
<tr>
<td>RFM10-MOT</td>
<td>Receiver module with motor control output and override input</td>
</tr>
</tbody>
</table>

DIMENSIONS

Terminals (not pictured) add additional height.
SPECIFICATIONS

Transmitter
- Frequency: 433MHz
- Frequency Control: FM
- Range: Keyfob transmitter: 50-100’ outdoor line of sight
- RF Power: 1mW, nominal
- Battery Type: 3-volt lithium coin cell, CR 2032

Receiver
- Power Requirement: 12vdc, 50mA max plus motor load current
- Antenna: Built-in, (external option)
- Output type: 25-amp, Solid state
- Field Wiring: Terminal blocks

Dimensions
- Overall: 4.0” L x 2.1” W x 1” H
- Mounting: Molded-in mounting tabs. Hardware included.

Environmental
- Sealing: Potted electronic module
- Storage: -40ºC to 85ºC
- Operating ambient temperature: -10ºC to 50ºC

WIRING

TERMINAL BLOCK LABELS:

M1  MOTOR, 20 AMPS MAX.
M2  MOTOR, 20 AMPS MAX.
GND CHASSIS GROUND / BATTERY NEG (-)
V+  12V BATTERY POS (+)
A   SWITCH (POSITION 1)
COM SWITCH POLE/COMMON
B   SWITCH (POSITION 2)
**MICRO LINK Series**  Short Range Radio Remote Control

**1 to 4 Function, Latching or Momentary**

**FEATURES**
- **Low Cost**
  Economical way to add radio control to simple, cost-sensitive applications.
- **Ergonomic**
  Compact belt-clip transmitter and keyfob transmitters available.
- **License Free**
  Pre-certified FCC - no license required.
- **Flexible**
  Can be configured for latching or momentary operation.

**APPLICATIONS**
- Electric gate
- Roll-up door
- Tarper
- Other

**OPERATION**

**Radio Operation**
Outdoor range of 20 to 100 feet line of sight. FM transmitter operates on 433MHz. No end-user license required.

**Relay (Digital) Outputs**
Up to 4 high-capacity 5-amp relays can be configured for latching or momentary operation. Pairs of relays can be wired to control directional devices such as linear actuator motors.

**Addressing**
DIP switch selectable radio address permits multiple radios to be used in the same area without causing false control.

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML433-KF4</td>
<td>Keyfob transmitter, 4-button</td>
</tr>
<tr>
<td>ML433-CT4</td>
<td>Compact transmitter, 4-function/8-button (4 on/4 off)</td>
</tr>
<tr>
<td>ML433-RX4</td>
<td>Receiver, 4 function (momentary or latching)</td>
</tr>
</tbody>
</table>
### SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>Transmitter</strong></th>
<th><strong>Frequency</strong></th>
<th>433MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency Control</strong></td>
<td>FM</td>
<td></td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Keyfob transmitter: 20-50’ outdoor line of sight  Compact transmitter: 50-100’ outdoor line of sight</td>
<td></td>
</tr>
<tr>
<td><strong>RF Power</strong></td>
<td>1mW, nominal</td>
<td></td>
</tr>
<tr>
<td><strong>Battery Type</strong></td>
<td>3-volt lithium coin cell, CR 2032</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Receiver</strong></th>
<th><strong>Power Requirement</strong></th>
<th>ML433-RX4: 12-30vdc, 250mA max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RF Output</strong></td>
<td>Built-in antenna</td>
<td></td>
</tr>
<tr>
<td><strong>Relays</strong></td>
<td>5-amp, SPDT (FormC)</td>
<td></td>
</tr>
<tr>
<td><strong>Field Wiring</strong></td>
<td>Terminal blocks</td>
<td></td>
</tr>
<tr>
<td><strong>Relay Mode</strong></td>
<td>Factory set for latching or momentary operation</td>
<td></td>
</tr>
<tr>
<td><strong>Packaging</strong></td>
<td>Plastic housing, not sealed</td>
<td></td>
</tr>
<tr>
<td><strong>Dimension</strong></td>
<td>ML433-RX4: 5.77” x 3.2” x 1.77”</td>
<td></td>
</tr>
</tbody>
</table>

### Environmental

<table>
<thead>
<tr>
<th><strong>Storage</strong></th>
<th>-40°C to 85°C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating</strong></td>
<td>-10°C to 60°C</td>
</tr>
</tbody>
</table>

![Diagram of the transmitter and receiver with dimensions](image-url)
## CAN Switches

**Product Selector**

*CAN enabled switch banks reduce and simplify wiring*

### CAN SWITCHES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Switch Banks</th>
<th>Maximum # of switches</th>
<th>Digital Inputs</th>
<th>Analog Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANSW100</td>
<td>Single bank brain module. Integrated directly to switch bank.</td>
<td>1</td>
<td>10</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>CANSW600</td>
<td>Multiple switch bank brain controller. Remote mount</td>
<td>6</td>
<td>60</td>
<td>120</td>
<td>4</td>
</tr>
<tr>
<td>CANSW4</td>
<td>4-switch bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CANSW6</td>
<td>6-switch bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CANSW8</td>
<td>8-switch bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CANSW10</td>
<td>10-switch bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CANSWTB</td>
<td>Terminal block board</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CANSWCABLE</td>
<td>Connects switch module to CANSW600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![CANSW4, 4-switch bank](image1.png)

![CANSW4, 6-switch bank with special order actuators](image2.png)

![CANSW600 brain module](image3.png)
# Speed Switches

**Product Selector**

*Control equipment based on RPM of belts, motors, or engine*

## SPEED SWITCHES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Tachometer Display</th>
<th>Relay Outputs</th>
<th>Relay Type</th>
<th>Analog Outputs</th>
<th>Sensor Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS200</td>
<td>Dash mount tach, volts, hours. Speed switch/feed controller.</td>
<td>YES</td>
<td>2</td>
<td>SOLID STATE 5-AMP</td>
<td>1</td>
<td>Mag pickup or prox switch</td>
</tr>
<tr>
<td>SS300</td>
<td>Three setpoint speed switch.</td>
<td>YES</td>
<td>3</td>
<td>FORM C 5-AMP</td>
<td>0</td>
<td>Mag pickup or prox switch</td>
</tr>
</tbody>
</table>

SS200 is easily set up with any Sony™ IR remote control
**BENEFITS**

- **Reduced Wiring**
  Clean up crowded control panels. Up to 56 switches and 4 analog inputs can be combined into a single CAN cable.

- **Flexible Configuration**
  Use your own preferred switches of virtually any type or arrangement.

- **Switch “friendly”**
  On-board power supply provides 32VDC excitation - reduces oxidation and extends switch life.

- **Analog/Proportional Inputs**
  4 analog inputs provided to incorporate analog devices such as potentiometers, sensors, or joysticks.

- **Wide Compatibility**
  Factory programmable for a wide range of CAN-compatible protocols and network addresses.

**APPLICATIONS**

- Simplify wiring in busy control panels and dashboards
- Reduce number of wires needed - great for long cable runs

**WIRING**

![Wiring Diagram]

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANSWTB</td>
<td>Terminal block for field wiring customer switches</td>
</tr>
</tbody>
</table>

Consult factory for available protocols.
**SPECIFICATIONS**

**General**
- Power requirement: 12-30vdc, 50mA nominal
- Fuse: Self-resetting

**Inputs**
- Digital: Up to 56 dry contact inputs
- Analog: 4 x 0.5v to 4.5vdc

**Communication**
- CAN: Compatible with most popular controllers, consult factory

**Dimensions/Mounting**
- CANSWTB: 6.5”l x 2.85”w x 1.85”h

**Environmental**
- Conformal coated, enclosure required for environmental sealing
- Operating temperature: -30°C to 65°C

---

**ADDRESS 0x96 (150 decimal)**

<table>
<thead>
<tr>
<th>BYTE 7</th>
<th>BYTE 6</th>
<th>BYTE 5</th>
<th>BYTE 4</th>
<th>BYTE 3</th>
<th>BYTE 2</th>
<th>BYTE 1</th>
<th>BYTE 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEARTBEAT</td>
<td>Analog IN 4 (MSB)</td>
<td>Analog IN 4 (LSB)</td>
<td>Analog IN 3 (MSB)</td>
<td>Analog IN 3 (LSB)</td>
<td>Analog IN 2 (MSB)</td>
<td>Analog IN 2 (LSB)</td>
<td>Analog IN 1 (LSB)</td>
</tr>
</tbody>
</table>

**Address 0x97 (151 decimal)**

<table>
<thead>
<tr>
<th>BYTE 7</th>
<th>BYTE 6</th>
<th>BYTE 5</th>
<th>BYTE 4</th>
<th>BYTE 3</th>
<th>BYTE 2</th>
<th>BYTE 1</th>
<th>BYTE 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEARTBEAT</td>
<td>NOT USED</td>
<td>NOT USED</td>
<td>NOT USED</td>
<td>NOT USED</td>
<td>NOT USED</td>
<td>NOT USED</td>
<td>NOT USED</td>
</tr>
</tbody>
</table>

Byte 7 reserved, TBD

Heartbeat output changes state every update. Controller should be programmed to monitor this output for fault detection.
Preconfigured switch banks with built-in CAN transceiver
Available in 4, 6, 8, or 10 switch banks. Customizable types

**BENEFITS**

- **Reduced Wiring**
  
  Pre-wired switch banks eliminate wiring and wiring mistakes. Saves time and money.

- **Easy Installation**
  
  Switch modules are pre-configured in mounting bezels for easy installation. A single 6-pin Deutsch DT series plug (included) provides network and power connections.

- **Flexible Configuration**
  
  Many factory-configured switch combinations are possible. Mix and match for your application. Available with the popular Contura™ rocker switches or toggle switches.

- **Analog/Proportional Inputs**
  
  4 inputs provided to incorporate analog devices such as potentiometers, sensors, or a joystick.

- **Wide Compatibility**
  
  Factory programmable for a wide range of CAN-compatible protocols and network addresses.

**APPLICATIONS**

- Simplify wiring in busy control panels and dashboards
- Reduce number of wires needed - great for long cable runs

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANSW100-XXX</td>
<td>CAN brain module</td>
</tr>
<tr>
<td>CANSW4</td>
<td>4-switch bank</td>
</tr>
<tr>
<td>CANSW6</td>
<td>6-switch bank</td>
</tr>
<tr>
<td>CANSW8</td>
<td>8-switch bank</td>
</tr>
<tr>
<td>CANSW10</td>
<td>10-switch bank</td>
</tr>
<tr>
<td>CANSWTB</td>
<td>Terminal block for field wiring customer switches</td>
</tr>
</tbody>
</table>

“XXXX” Factory-assigned protocol code
Consult factory for available protocols.

NOTE: Order CAN brain module and switch bank separately. CANSW100 brain will be factory installed to selected switch bank.
**Specifications**

**General**
- Power requirement: 12-30vdc, 250mA nominal
- Fuse: Self-resetting

**Inputs**
- Digital: Up to 20 dry contact (10 x SPDT switches)
- Analog: 2 x 0.5v to 4.5vdc on 3-pos. terminal blocks

**Communication**
- CANBUS: Compatible with most popular controllers, consult factory

**Dimensions/Mounting**
- CANSW4: 4.08” x 1.90” cutout
- CANSW6: 6.14” x 1.90” cutout
- CANSW8: 8.20” x 1.90” cutout
- CANSW10: 10.26” x 1.90” cutout
- All Switch Banks: Behind panel depth 2.75”

**Environmental**
- Switch Banks: IP67 above panel with sealing gasket provided
- Additional sealing is recommended around bezel at panel opening
- CANSW100 brain: Must be installed in weathertight enclosure
- Operating temperature: -30ºC to 65ºC

**Wiring**

**Point Map**
- Address: 11 or 29 bits factory set - consult factory for specific requirements
- Data Rate: 250kbps; update 20 times per second

(byte sequences and pin configurations as per diagram)
CANSWITCH 600

CAN transceiver for multiple, preconfigured switch banks

Up to 6 banks of 4, 6, 8, or 10 switches. Customizable types

BENEFITS

- **Reduced Wiring**
  Pre-wired switch banks eliminate wiring and wiring mistakes. Saves time and money.

- **Easy Installation**
  Switch modules are pre-configured in mounting bezels for easy installation. A single 6-pin Deutsch DT series plug (included) provides network and power connections.

- **Flexible Configuration**
  Many factory-configured switch combinations are possible. Mix and match for your application. Available with the popular Contura™ rocker switches or toggle switches.

- **Analog/Proportional Inputs**
  4 inputs provided to incorporate analog devices such as potentiometers, sensors, or a joystick.

- **Wide Compatibility**
  Factory programmable for a wide range of CAN-compatible protocols and network addresses.

APPLICATIONS

- Simplify wiring in busy control panels and dashboards
- Reduce number of wires needed - great for long cable runs

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANSW600-XXXX</td>
<td>CAN brain module</td>
</tr>
<tr>
<td>CANSW4</td>
<td>4-switch bank</td>
</tr>
<tr>
<td>CANSW6</td>
<td>6-switch bank</td>
</tr>
<tr>
<td>CANSW8</td>
<td>8-switch bank</td>
</tr>
<tr>
<td>CANSW10</td>
<td>10-switch bank</td>
</tr>
<tr>
<td>CANSWCABLE</td>
<td>Cable, 24&quot; for switch bank connections</td>
</tr>
</tbody>
</table>

“XXXX” Factory-assigned protocol code

Consult factory for available protocols.

NOTE: Order CAN brain module and switch banks separately. CANSW600 can accept up to 6 switch banks. Order cables for switch banks separately.
### SPECIFICATIONS

#### General
- **Power Requirement**: 12-30vdc, 250mA nominal
- **Fuse**: Self-resetting

#### Inputs
- **Digital**: Up to 6 banks of 4, 6, 8, or 10 switches (SPDT) mix and match
- **Analog**: 4 x 0.5v to 4.5vdc

#### Communication
- **CANBUS**: Compatible with most popular controllers, consult factory

#### Dimensions/Mounting
- **CANSW600**: Overall 7.23” x 4.23” x 1.35”
  - Mounting 4 x 0.2” diam holes at corners of 6.72” x 3.6” rectangle
- **CANSW4**: 4.08” x 1.90” cutout
- **CANSW6**: 6.14” x 1.90” cutout
- **CANSW8**: 8.20” x 1.90” cutout
- **CANSW10**: 10.26” x 1.90” cutout
- **All Switch Banks**: Behind panel depth 2.75”

#### Environmental
- **Switch Banks**: IP67 above panel with sealing gasket provided
- **CANSW600**: Must be installed in weather tight enclosure
  - Operating temperature -30°C to 65°C

### WIRING

```
<table>
<thead>
<tr>
<th>PIN</th>
<th>CANBUS</th>
<th>SWITCH BANKS</th>
<th>ANALOG INPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GROUND - NEGATIVE</td>
<td></td>
<td>A IN 1</td>
</tr>
<tr>
<td>2</td>
<td>BATTERY + POSITIVE</td>
<td>WIRE STRAIGHT THROUGH CONNECTOR AT EACH END</td>
<td>A IN 2</td>
</tr>
<tr>
<td>3</td>
<td>CAN HI</td>
<td></td>
<td>A IN 3</td>
</tr>
<tr>
<td>4</td>
<td>CAN LO</td>
<td></td>
<td>A IN 4</td>
</tr>
<tr>
<td>5</td>
<td>CAN SHIELD</td>
<td></td>
<td>GROUND</td>
</tr>
<tr>
<td>6</td>
<td>NO CONNECT</td>
<td></td>
<td>+5v OUT</td>
</tr>
</tbody>
</table>
```

### POINT MAP

- **Address**: 11 or 29 bits factory set - consult factory for specific requirements
- **Data Rate**: 250kbps; update 20 times per second

Consult factory or website for example point map document.
SS200 Dash Mounted Speed Switch

Tachometer, Hour Meter, Volt Meter, Automatic Feed Controller

FEATURES

- **Bright LED Display**
  Easy to read, four-digit LED for tachometer display and setup information. Bright individual LEDs indicate output status.

- **Easy Field Adjustment**
  3-key rugged touchscreen interface for fast and secure field adjustment. Factory calibration settings protected from operator.

- **Fast Commissioning**
  Infrared remote setup. Program settings and default quickly using any Sony™ television compatible remote control.

- **Environmentally Sealed**
  Rugged sealed enclosure for harsh off-highway applications.

- **Solid State Electronics**
  Touchpad technology outlasts mechanical pushbuttons in harsh environments. Solid state outputs survive countless operations and eliminate wear.

APPLICATIONS

- **Feed Controller**
  Automatic feed control for grinders, crushers, chippers, shredders and other equipment. Prevents damage from engine stall or overload.

- **Instrument**
  Tachometer, hour meter, and volt meter in one dash-mount package.

- **Interlock**
  Prevent engagement of PTO when engine RPM is below minimum requirement.

- **Rev Limiter**
  Disable throttle up input on cruise control module when maximum desired RPM is reached.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS200</td>
<td>Dash mount tachometer and feed controller</td>
</tr>
<tr>
<td>SS200-ICT</td>
<td>Infrared commissioning tool</td>
</tr>
</tbody>
</table>

ORDERING INFORMATION

OPERATION

**Field Operation**

Normal operation:
Press “O” button to toggle between RPM display, hours, or volts.

Output control (on/off):
Press and hold “+” button for 3 seconds to enable outputs.
Press and hold “-” button for 3 seconds to disable outputs.

Programming:
Press and hold “O” button for 3 seconds to enter programming mode. Press “O” button momentarily to select parameter to adjust. Press “+” and “-” buttons to change setting. Adjustable parameters include high and low set points, and reverse time if applicable.

**Factory Calibration**

Factory calibration is performed quickly and easily using any Sony™ television compatible infrared remote control. Factory calibrations include number of teeth for pulse pickup, mode of operation, and all field adjustable parameters.
Press TV on remote to select television mode.
Press POWER 5 times in 2 seconds to enter programming mode.
Press CHANNEL +/- to select parameter to adjust.
Press VOLUME +/- to change value.
Press number keys to enter values directly.
Press ENT to save and exit programming mode.
**SPECIFICATIONS**

**General**
- Power requirement: 9-15vdc, 500mA nominal + power to loads
  24vdc version available
- Outputs: Solid State Sourcing; 5-amps max

**Sensor Input**
- Type: Magnetic pickup, 5-30vpp AC
  Proximity switch, open drain
- Frequency Range: 10 to 10,000Hz

**Performance**
- Response Time: 1/10th second
- Accuracy: 10Hz
- RPM Range: 0 to 9,999 RPM

**Interface**
- Touchpad menu interface for field operation
  Infrared receiver for factory commissioning

**Display**
- Type: 4-digit LED
- Parameters: RPM, Volts, Hours, settings
- Output Status: 3 x LED

**Mounting**
- Mounts in 3.25” round hole
  Mounting bracket, hardware, gasket included

**Environmental**
- Storage: -40ºC to 85ºC
  Operating: -10ºC to 60ºC

**MODES**

<table>
<thead>
<tr>
<th>MODE</th>
<th>OUTPUT</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BELOW LOW-SET</td>
</tr>
<tr>
<td>0</td>
<td>OUT1</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td>OUT2</td>
<td>NOT USED</td>
</tr>
<tr>
<td>1</td>
<td>OUT1</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>OUT2</td>
<td>ON FOR REV TIME</td>
</tr>
<tr>
<td>2</td>
<td>OUT1</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>OUT2</td>
<td>OFF</td>
</tr>
<tr>
<td>3</td>
<td>OUT1</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td>OUT2</td>
<td>ON</td>
</tr>
</tbody>
</table>

DEADBAND: Output remains in previous state. If RPM is increasing, output stays in “below low-set” state. If RPM is decreasing, output stays in “above high-set” state.

Other factory programmable modes possible.
**SS300 Panel Mounted Speed Switch**

*Programmable Tachometer with 3 Setpoint Relays*

**APPLICATIONS**

- **Feed Controller**
  Automatic feed control for grinders, crushers, chippers, shredders and other equipment. Prevents damage from engine stall or overload.

- **Instrument**
  Tachometer.

- **Interlock**
  Prevent engagement of PTO when engine RPM is below minimum requirement.

- **Rev Limiter**
  Disable throttle up input on cruise control module when maximum desired RPM is reached.

**FEATURES**

- **Tachometer**
  Easy to read, four-digit LED display indicates engine RPM

- **Easy Setup**
  Digital display and pushbutton interface allows setup without running engine. Simply enter the number of pulses per revolution (number of teeth) and setpoints for each relay.

- **Multiple Outputs**
  Three form-C (SPDT) relays can each have a different alarm threshold. 10-amp capacity suitable for driving valve coils.

- **Wide Input Range**
  Built-in voltage regulator allows SS300 to operate on 12 or 24-volt systems. Accepts magnetic sensor or open drain proximity switch.

**OPERATION**

**Setup**

Press SEL button to select “TEETH” from menu. Use INC/+ and DEC/- until display reads the number of teeth on the sensor gear. If number of teeth is unknown, set TEETH = 60 and use the formula:

\[
\text{SS300 RPM reading} \times 60 / \text{Engine RPM} = \# \text{ of teeth}
\]

Press SEL button again to select “SET1” from menu. Use INC/+ and DEC/- until display reads the desired setpoint. Relay will be energized when RPM is at or above setpoint. Repeat to program SET2 and SET3 if needed.

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS300</td>
<td>Panel mount tachometer and feed controller</td>
</tr>
</tbody>
</table>
**SPECIFICATIONS**

**General**
- Power Requirement: 9-30vdc, 300mA nominal + power to loads
  - 24vdc version available
- Relays: 3 x Form C (SPDT)
- Rating: 10-amp DC
- Type: Magnetic pickup, 5-30vpp AC
  - Proximity switch, open drain
- Frequency Range: 100 to 10,000Hz
- Response Time: 1/10th second
- RPM Range: 0 to 3,500 RPM
- Accuracy: 1-10 teeth: 1/2 second response, 2Hz accuracy
  - 11-100 teeth: 1/4 second response, 4Hz accuracy
  - 101-200 teeth: 1/16 second response, 16Hz accuracy

**Outputs**
- Relays: 3 x Form C (SPDT)
  - Rating: 10-amp DC

**Sensor Input**
- Type: Magnetic pickup, 5-30vpp AC
  - Proximity switch, open drain
  - Frequency Range: 100 to 10,000Hz
  - Response Time: 1/10th second
  - RPM Range: 0 to 3,500 RPM
  - Accuracy: 1-10 teeth: 1/2 second response, 2Hz accuracy
    - 11-100 teeth: 1/4 second response, 4Hz accuracy
    - 101-200 teeth: 1/16 second response, 16Hz accuracy

**Performance**
- Response Time: 1/10th second
- RPM Range: 0 to 3,500 RPM
- Accuracy: 1-10 teeth: 1/2 second response, 2Hz accuracy
  - 11-100 teeth: 1/4 second response, 4Hz accuracy
  - 101-200 teeth: 1/16 second response, 16Hz accuracy

**Interface**
- Pushbutton/LED menu

**Display**
- Type: 4-digit LED

**Dimensions**
- 6.125” L x 3.625” W x 1.5” H

**Environmental**
- Storage: -40°C to 85°C
- Operating: -10°C to 60°C

---

**WIRING**

- B-
- MAG-
- MAG+
- 1NC
- 1NO
- 1POLE
- 2NC
- 2NO
- 2POLE
- 3NC
- 3NO
- 3POLE
- VEHICLE BATTERY NEGATIVE OR GROUND
- VEHICLE BATTERY POSITIVE +12 OR +24
- MAGNETIC PICKUP
- PROXIMITY SENSOR OPTION
- PROXIMITY SWITCH OPEN-DRAIN
**FC100 Proportional fan control thermostat**

*Smart controller with fault detection*

**FEATURES**

- **Easy Installation**
  No setup or configuration required. Compatible with a wide range of temperature sender probes. Ideal for retrofit. Optional mounting bracket available.

- **Proportional soft-start**
  Slowly ramps up fan speed to reduce mechanical shock and increase motor life. Safety is improved by slowly starting fan.

- **Solid State**
  High current, reliable solid-state output can drive up to 25-amp fan loads directly. No relays to fail.

- **Override Input**
  Override input allows fan to be energized remotely by a switch, sensor, or other controller.

- **Fault Detection**
  Automatically detects fan and temperature sender failure. LED blinks fault codes for easy troubleshooting.

- **Alarm Output**
  Alarm output energized on fault detection or over-temperature condition. Automatically shut down equipment or activate light or siren.

**OPERATION**

Controller monitors temperature sender and controls fan to maintain 120-130degF oil temperature. (Other temperature setpoints available. Consult factory.)

Active fault detection monitors temperature sender and fan current. Led blinks fault codes for troubleshooting:

- **Solid** Normal Operation
- 1 blink (* *) Fan open / No load
- 2 blink (** **) Fan shorted / Over current
- 3 blink (***) *** Temp sensor open
- 4 blink (**** ****) Over temp alarm, above 185degF

Alarm output is energized in fault condition. (0.5-amp max.)

Output is operated continuously at 100% in temp sensor open condition. (broken temperature sensor wire)

If multiple faults are detected, fault codes are flashed sequentially.

Energize override input to manually run fan at 100%.

**DIMENSIONS**

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC100</td>
<td>Fan Controller Module with temperature sender included</td>
</tr>
<tr>
<td>TS10</td>
<td>Temperature sender probe only</td>
</tr>
<tr>
<td>FCB</td>
<td>Fan Controller mounting bracket only</td>
</tr>
</tbody>
</table>

Consult factory for compatibility with other temperature senders.
**SPECIFICATIONS**

**General**

Power Requirement 12-24vdc, 100mA nominal + power to FAN

**Outputs**

Fan

Solid-State proportional output. 25-Amps Max.

Output de-energized on overcurrent (>30 amps) fan condition. Reset power to retry.

Alarm

Solid-State open collector, positive output. 0.5-Amp Max.

Alarm output energized on fault or above high temperature limit.

**Control Range**

Operation

130degF = ramp to 100%, 120degF = off.

Other setpoint temperatures possible. Consult factory.

High Temperature Limit

185degF Alarm output energized.

**Inputs**

Temperature

For use with Datcon 02024-00 (Miratron TS10)

Override

Connect to 12 or 24Vdc (battery) to energize fan.

**Indicators**

Fault LED

Solid = Normal operation

1 blink = Open or disconnected fan motor

2 blink = Shorted or overcurrent fan motor

3 blink = Temp sensor open or out of range

4 blink = Over temp alarm

**Dimensions**

Overall

3.0” L x 1.6” W x 1” H

Mounting Hardware included. Optional mounting bracket available.

**Environmental**

Sealing Potted electronic module

Storage -40ºC to 85ºC

Operating ambient temperature (FS100 controller temperature only) -10ºC to 50ºC

**WIRING**

**TERMINAL BLOCK LABELS:**

GND CHASSIS GROUND / BATTERY NEG (-)

GND FAN GROUND (IF NEEDED)

O/R OVERRIDE INPUT (+12/24V)

V+ 12/24V BATTERY POS (+)

FAN FAN OUTPUT, 25 AMPS MAX.

ALM ALARM OUTPUT, 0.5 AMP MAX.

TS+ TEMP SENDER (+) (ONE WIRE TYPES)

TS- TEMP SENDER (-) (TWO WIRE TYPES)
FRC20 Reversing fan controller

Automatically reverses fan to clean cooler

FEATURES

- **Easy Installation**
  No setup or configuration required. Ideal for retrofit. Terminal blocks provided for easy wiring.

- **Proportional soft-start**
  Slowly ramps up fan speed to reduce mechanical shock and increase motor life. Safety is improved by slowly starting fan.

- **Solid State**
  High current, reliable solid-state output can drive up to 25-amp fan loads directly. No relays to fail.

- **Auto Reversing**
  Automatically reverses fan direction to clear debris from cooler, improving efficiency.

The FRC20 is an affordable, auto-reversing fan controller with soft-start to protect fan motors

OPERATION

When TS+ and TS- input terminals are electrically connected by either a switch or thermostat, the fan controller ramps fan on momentarily in reverse to clear debris from cooler. Fan is then allowed to spin down, and ramped back on in forward direction. When the TS inputs are disconnected or opened, fan is momentarily reversed again.

Consult factory for special requirements, or other programming options.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRC20</td>
<td>Fan Reversing Controller</td>
</tr>
</tbody>
</table>

DIMENSIONS

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0”</td>
<td>Width</td>
</tr>
<tr>
<td>3.5”</td>
<td>Height</td>
</tr>
<tr>
<td>2.1”</td>
<td>Depth</td>
</tr>
<tr>
<td>Ø0.186 (2 PLCS.)</td>
<td>Hole Diameter</td>
</tr>
<tr>
<td>3.3”</td>
<td>Overall Height</td>
</tr>
<tr>
<td>1.0”</td>
<td>Overall Width</td>
</tr>
<tr>
<td>0.125  (2 PLCS.)</td>
<td>Overall Depth</td>
</tr>
</tbody>
</table>
**SPECIFICATIONS**

**General**
- Power Requirement: 12-24vdc, 100mA nominal + power to FAN

**Outputs**
- Fan: Solid-State proportional output. 25-Amps Max.

**Operation**
- Reverse time: 10 seconds
- Ramp on time: 5 seconds

**Input**
- TS+/TS-: Short together to energize fan

**Dimensions**
- Overall: 4.0” L x 2.1” W x 1” H
- Mounting: Hardware included.

**Environmental**
- Sealing: Potted electronic module
- Storage: -40ºC to 85ºC
- Operating ambient temperature: -40ºC to 50ºC

**TERMINAL BLOCK LABELS:**
- FAN +: FAN OUTPUT, 25 AMPS MAX.
- FAN -: FAN OUTPUT, 25 AMP MAX.
- GND: CHASSIS GROUND / BATTERY NEG (-)
- V+: 12/24V BATTERY POS (+)
- TS+: THERMOSTAT INPUT (+)
- TS-: THERMOSTAT INPUT (-)
**FRC100 Deluxe reversing fan controller**

*Smart reversing fan controller with fault detection*

**FEATURES**

- **Easy Installation**
  No setup or configuration required. Ideal for retrofit. Terminal blocks provided for easy wiring. Optional mounting bracket available.

- **Proportional soft-start**
  Slowly ramps up fan speed to reduce mechanical shock and increase motor life. Safety is improved by slowly starting fan.

- **Solid State**
  High current, reliable solid-state output can drive up to 25-amp fan loads directly. No relays to fail.

- **Auto Reversing**
  Automatically reverses fan direction to clear debris from cooler, improving efficiency.

- **Override/Thermostat Mode**
  Mode input allows fan to be energized remotely by a switch, thermostat, or other controller.

- **Fault Detection**
  Automatically detects fan and temperature sender failure. LED blinks fault codes for easy troubleshooting.

- **Alarm Output**
  Alarm output energized on fault detection or over-temperature condition. Automatically shut down equipment or activate light or siren.

**OPERATION**

Controller monitors temperature sender and controls fan to maintain field-selectable oil temperature.

Fan controller ramps fan on momentarily in reverse to clear debris from cooler. Fan is then allowed to spin down, and ramped back on in forward direction.

Active fault detection monitors temperature sender and fan current. Led blinks fault codes for troubleshooting:

- Solid Normal Operation
- 1 blink (* *) Fan open / No load
- 2 blink (**) ** Fan shorted / Over current
- 3 blink (***) *** Temp sensor open
- 4 blink (**** ****) Over temp alarm, above 185degF

Alarm output is energized in fault condition. (0.5-amp max.)

Output is operated continuously at 100% in temp sensor open condition. (broken temperature sensor wire)

If multiple faults are detected, fault codes are flashed sequentially.

Ground TS+ and MODE input to manually run fan at 100%.

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRC100</td>
<td>Deluxe Fan Reversing Controller with temperature sender included</td>
</tr>
<tr>
<td>TS10</td>
<td>Temperature sender probe only</td>
</tr>
<tr>
<td>FCB</td>
<td>Fan Controller mounting bracket only</td>
</tr>
</tbody>
</table>

**DIMENSIONS**

Temperature adjustment shown without protective cover.

The FRC100 is an affordable, auto-reversing fan controller with soft-start, selectable temperature threshold, fault monitoring, and auxiliary alarm output.
## SPECIFICATIONS

### General
- **Power Requirement**: 12-24vdc, 100mA nominal + power to FAN

### Outputs
- **Fan**: Solid-State proportional output. 25-Amps Max.
- **Output de-energized on overcurrent (>30 amps) fan condition. Reset power to retry.**

### Operation
- **Reverse time**: 10 seconds
- **Ramp on time**: 5 seconds
- **Alarm**: Solid-State open collector, positive output. 0.5-Amp Max.
- **Alarm output energized on fault or above high temperature limit.**

### Control Range
- **Operation**: Temperature above setpoint = ramp to 100% output
- **Setpoint adjustment range**: 120 to 180degF
- **High Temperature Limit**: 185degF Alarm output energized.

### Inputs
- **Temperature**: For use with Datcon 02024-00 (Miratron TS10)
- **Mode**: Connect to 12 or 24Vdc (battery) and ground TS+ to energize fan.

### Indicators
- **Fault LED**: Solid = Normal operation
  - 1 blink = Open or disconnected fan motor
  - 2 blink = Shorted or overcurrent fan motor
  - 3 blink = Temp sensor open or out of range
  - 4 blink = Over temp alarm

### Dimensions
- **Overall**: 4.0” L x 2.1” W x 1” H
- **Mounting**: Hardware included. Optional mounting bracket available.

### Environmental
- **Sealing**: Potted electronic module
- **Storage**: -40ºC to 85ºC
- **Operating ambient temperature (FRC100 controller temperature only)**: -10ºC to 50ºC

## WIRING

**Terminal Block Labels:**
- **TS + TEMP SENDER (+) OR THERMOSTAT**
- **TS - TEMP SENDER (-) OR THERMOSTAT**
- **ALM ALARM OUTPUT, 0.5 AMP MAX.**
- **MODE MODE SELECT**
- **V+ 12/24V BATTERY POS (+)**
- **GND CHASSIS GROUND / BATTERY NEG (-)**
- **FAN + FAN OUTPUT, 25 AMPS MAX.**
- **FAN - FAN OUTPUT, 25 AMP MAX.**
## Valve Driver Product Selector

*Interface control devices to valve actuators*

### MODELS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Description</th>
<th>Analog Inputs</th>
<th>Voltage Input</th>
<th>Digital Outputs</th>
<th>Adjustable Ramping</th>
<th>Proportional Outputs</th>
<th>Proportional Output Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC1200</td>
<td>Factory configurable I/O module with field adjustable parameters</td>
<td>Up to 5</td>
<td>Up to 5</td>
<td>Up to 10</td>
<td>YES</td>
<td>Up to 10</td>
<td>PWM and/or ratiometric</td>
</tr>
<tr>
<td>PC10</td>
<td>Compact potted module</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>YES</td>
<td>2</td>
<td>PWM current</td>
</tr>
<tr>
<td>PC20</td>
<td>Compact potted module with built-in potentiometer</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>YES</td>
<td>2</td>
<td>PWM current</td>
</tr>
<tr>
<td>PC100</td>
<td>Panel-mount card, 1-channel</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>YES</td>
<td>1</td>
<td>PWM current</td>
</tr>
<tr>
<td>PC200</td>
<td>Panel-mount card, 2-channel</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>YES</td>
<td>2</td>
<td>PWM current</td>
</tr>
</tbody>
</table>

![PC1200](image1.png)  
![PC100/200](image2.png)  
![PC20](image3.png)
**PC1200 Programmable I/O Module**

Up to 5 Analog Inputs, 10 Proportional or Digital Outputs

**FEATURES**

- **Easy Setup**
  
  LCD display and pushbutton menu interface makes setup a snap. Self-contained - no PC or software required.

- **Field Adjustable Parameters**
  
  Easy field adjustment of min, max, ramp up, ramp down, threshold, and other customer-specified options.

- **Flexible Output Types**
  
  Up to 10 outputs including PWM current, digital (bang/bang), ratiometric, or unamplified (0-5v or 0-10v)

- **Analog Inputs**
  
  Up to 5 analog inputs 0.5 to 4.5v compatible with a wide range of joysticks, potentiometers, and sensors.

- **Rugged Enclosure**
  
  Deutsch IP67 rated enclosure with mating pigtail connector and wiring provided.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>General</th>
<th>Power Requirement</th>
<th>12-30vdc, 100mA nominal + power to loads</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fuses</td>
<td>10-amp mini blade fuse in wiring harness</td>
</tr>
<tr>
<td>Inputs</td>
<td>Analog</td>
<td>Up to 5, 0.5 to 4.5vdc, factory configured</td>
</tr>
<tr>
<td>Outputs</td>
<td>Universal</td>
<td>Up to 10 sourcing 5-amp outputs</td>
</tr>
<tr>
<td></td>
<td>Field Wiring</td>
<td>6’ pigtail with mating Deutsch DTM connector</td>
</tr>
<tr>
<td>Enclosure</td>
<td></td>
<td>Nylon 6/6 black, IP66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Approximate size: 5.24”L x 4.63”W x 1.48”D</td>
</tr>
<tr>
<td>Environmental</td>
<td>Storage</td>
<td>-40°C to 85°C</td>
</tr>
<tr>
<td></td>
<td>Operating</td>
<td>-10°C to 60°C</td>
</tr>
</tbody>
</table>

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC1200-xxxx</td>
<td>Programmable I/O module</td>
</tr>
</tbody>
</table>

“xxxx” Factory assigned configuration number.
**PC10 Panel Mounted Proportional Control**

Panel mounted proportional valve driver

---

**FEATURES**

- **Easy Installation**
  Installs directly on control panel with only 2 screws. Hardware included.

- **Easy Setup**
  Pushbutton “teach” feature simplifies setup of min/max output adjustment and ramp up/down time. No PC, PDA, or other tools needed.

- **Flexible**
  Operates one or two valve coils for speed and direction control. Version available for ratiometric valve actuators. Compatible with resistive or hall-effect (0.5 to 4.5v) joysticks or potentiometers.

- **Proportional Control**
  High-resolution solid-state output(s) for fine control of loads up to 5-Amps DC

- **Compact Size**
  Only 1.6” wide - Fits easily in tight spaces. Ideal building block for control panels.

- **Rugged Construction**
  Robust potted module keeps electronics protected. IP65 environmentally rated pushbuttons and potentiometer.

---

**OPERATION**

Controller provides proportional PWM or ratiometric output(s) up to 5-Amps from the position of a potentiometer or joystick.

The PC-10 can be field programmed to operate in single-coil or dual-coil mode.

In single-coil mode, the potentiometer or joystick controls a single proportional output.

In dual-coil mode, Output 1 is controlled from the center position of the knob to the fully CW position, and Output 2 is controlled from the center position of the knob to the fully CCW position.

The minimum/maximum output settings, and ramp up/down times are fully programmable in the field for single and dual-coil operation.

Field programming is accomplished using only 2 pushbuttons and the potentiometer or joystick. See operation manual for complete programming instructions.

---

**DIMENSIONS**

Knob and panel seal not shown.

---

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC10</td>
<td>Proportional Controller, Single/Dual valve speed/direction control</td>
</tr>
</tbody>
</table>
**SPECIFICATIONS**

**General**
- Power requirement: 9-30vdc, 50mA nominal + power to loads and joystick

**Outputs**
- PWM Frequency: 200Hz
- Dither: Fixed
- PWM current: 0 to supply voltage, 5-amps max
- +5V excitation: 100mA MAX.
- Adjustments: Min/Max: 0 to V+
  - Ramp up/down
- Deadband: Built-in 10 degree deadband around neutral position

**Input**
- Voltage: 0.5 to 4.5Vdc (5Vdc excitation provided for resistive controls)

**Dimensions**
- Overall: 3.0”L x 1.6”W x 1”H (behind panel depth)
- Mounting: 2 x #8-32 X 1/2” machine screws

**Environmental**
- Storage: -40ºC to 85ºC
- Operating: -10ºC to 60ºC

**WIRING**

*NOTE: 1.3k Ohm resistors required to set input range at 0.5 to 4.5v (10-90%). Joysticks may have these resistors included internally. If a 10 to 90% operating range joystick is used, the external resistors are not required.*

<table>
<thead>
<tr>
<th>OUT 1</th>
<th>OUT 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SINGLE</strong></td>
<td><strong>NOT used.</strong></td>
</tr>
<tr>
<td>Proportional output - Clockwise from neutral</td>
<td></td>
</tr>
<tr>
<td><strong>DUAL</strong></td>
<td>Proportional output - Counterclockwise from neutral</td>
</tr>
</tbody>
</table>
**PC20 Panel Mounted Proportional Control**

*Panel mounted proportional valve driver with integrated potentiometer*

---

**The PC20 makes fast and easy work out of designing and assembling valve control panels.**

**FEATURES**

- **Easy Installation**
  Built in potentiometer reduces wiring and simplifies installation. Installs directly on control panel with only 2 screws. Knob, panel seal, hardware, and centering spring (optional) included.

- **Easy Setup**
  Pushbutton “teach” feature simplifies setup of min/max output adjustment and ramp up/down time. No PC, PDA, or other tools needed.

- **Flexible**
  Operates one or two valve coils for speed and direction control. Version available for ratiometric valve actuators.

- **Proportional Control**
  High-resolution solid-state output(s) for fine control of loads up to 5-Amps DC.

- **Compact Size**
  Only 1.6” wide - Fits easily in tight spaces. Ideal building block for control panels.

- **Rugged Construction**
  Robust potted module keeps electronics protected. IP65 environmentally rated pushbuttons and potentiometer.

**OPERATION**

Controller provides proportional PWM or ratiometric output(s) up to 5-Amps from the position of a built-in potentiometer.

The PC-20 can be field programmed to operate in single-coil or dual-coil mode.

In single-coil mode, the built-in potentiometer controls a single proportional output over the full mechanical range of the knob.

In dual-coil mode, Output 1 is controlled from the center position of the knob to the fully CW position, and Output 2 is controlled from the center position of the knob to the fully CCW position.

The minimum/maximum output settings, and ramp up/down times are fully programmable in the field for single and dual-coil operation.

Field programming is accomplished using only 2 pushbuttons and the control knob. See operation manual for complete programming instructions.

---

**DIMENSIONS**

---

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC20</td>
<td>Proportional Controller, Single/Dual valve speed/direction control</td>
</tr>
</tbody>
</table>

---

Knob and panel seal not shown.
**SPECIFICATIONS**

**General**  
Power requirement: 9-30vdc, 50mA nominal + power to loads

**Outputs**  
PWM Frequency: 200Hz  
Dither: Fixed
  
PWM current: 0 to supply voltage, 5-amps max  
Adjustments: Min/Max: 0 to V+ Ramp up/down
  
Deadband: Built-in 10 degree deadband around neutral position

**Input**  
Potentiometric: Controlled by built-in potentiometer

**Dimensions**  
Overall: 3.0” L x 1.6” W x 1” H (behind panel depth)

**Environmental**  
Storage: -40ºC to 85ºC  
Operating: -10ºC to 60ºC

---

**WIRING**

**INSTALLATION**

<table>
<thead>
<tr>
<th>Option</th>
<th>OUT 1</th>
<th>OUT 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE</td>
<td>Proportional output - Clockwise from neutral</td>
<td>Not used.</td>
</tr>
<tr>
<td>DUAL</td>
<td>Proportional output - Clockwise from neutral</td>
<td>Proportional output - Counterclockwise from neutral</td>
</tr>
</tbody>
</table>
PC100 Proportional Controller Card, Single

One pot or joystick controls one proportional output.

FEATURES

- **Simple, Complete Solution**
  Complete, single component interface allows virtually any joystick or potentiometer to directly control a PWM current operated valve actuator.

- **Universal Inputs**
  Compatible with a wide range of input devices, including potentiometers, transducers, and other devices producing 0 to 10vdc, 0 to 5vdc, or 0.5 to 4.5vdc control signals. Also accepts inputs from switches for manual override.

- **Fully Adjustable**
  Adjustable min, max, ramp-up, ramp-down, dither, and threshold (deadband). Great for setting a desired operating range and “feel.”

- **Versatile Outputs**
  One high-capacity proportional output and one digital output are ideal for simple control applications. Outputs can drive up to 5-amp coils directly.

OPERATION

**Input Signal**
Jumper selectable 0 to 5vdc or 0.5 to 4.5vdc input. Use resistor divider (see installation instructions) to accommodate 0-10vdc input signal. Use 250-ohm shunt resistor (see installation instructions) to accommodate 4 to 20mA input signal.

**Adjustments**
Min, max, ramp up, ramp down, dither, and threshold (deadband) are adjustable from 0-99% of full-scale range. See specifications for adjustment ranges.

**Outputs**
Proportional and digital outputs can drive up to 5-amp coils directly. Digital output operates whenever joystick or pot is above threshold (deadband) setting. This output can be used to operate a pump or other control valve.

**Manual Operation**
Inputs are provided for a toggle switch to manually override or “bump” the output signal without using a joystick or potentiometer.

OPERATION DIAGRAM

<table>
<thead>
<tr>
<th>0V (0.5V)</th>
<th>5V (4.5V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUT1</td>
<td>MAX</td>
</tr>
<tr>
<td></td>
<td>MIN</td>
</tr>
<tr>
<td>A</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

SETUP
Pushbutton and LED menu interface simplifies adjustments. Digital setup eliminates guesswork.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC100</td>
<td>Single coil valve driver</td>
</tr>
</tbody>
</table>
## SPECIFICATIONS

### General
- **Power requirement**: 9-30vdc, 250mA nominal + power to loads
- **Fuse**: Blade fuse, 15-amp

### Digital Output
- **Type**: Sourcing
- **Output**: Same as supply voltage, 5-amps max

### PWM Output
- **Frequency**: 1700Hz
- **Dither**: 100Hz, 0-10% of max current
- **Output**: Same as supply voltage, 5-amps max
- **Adjustments**:
  - Min/Max: 0-5-amps
  - Ramp up/down: 0.1 to 5 seconds
  - Threshold: 0 to 2vdc
  - Dither: 0-10%

### Analog Input
- **Signal Range**: 0 to 5vdc or 0.5 to 4.5vdc, jumper selectable
- **Courtesy Power**: +5vdc, 50mA max signal provided for potentiometer
- **1k pot recommended**

### Digital Inputs
- **Manual Switches**: Dry contact - connect “SEND” to SW1+ or SW1-
- **Disable**: Connect to power terminal to disable control
  - Do not use disable input for safety control

### Dimensions
- **Overall**: 4.8”L x 4.25” W x 1.125” D
- **Mounting**: 4 x #6 self-tapping screws

### Environmental
- **Storage**: -40ºC to 85ºC
- **Operating**: -10ºC to 60ºC

### WIRING EXAMPLES:

![Wiring Diagram 1](image1)

![Wiring Diagram 2](image2)

![Wiring Diagram 3](image3)
One pot or joystick controls two proportional outputs (fwd/rev).

FEATURES

- **Simple, Complete Solution**
  Complete, single component interface allows virtually any joystick or potentiometer to directly control two PWM current operated valve actuators.

- **Universal Inputs**
  Compatible with a wide range of input devices, including potentiometers, transducers, and other devices producing 0 to 10vdc, 0 to 5vdc, or 0.5 to 4.5vdc control signals. Also accepts inputs from switches for manual override.

- **Fully Adjustable**
  Adjustable min, max, ramp-up, ramp-down, dither, and threshold (deadband). Great for setting a desired operating range and “feel.”

- **Versatile Outputs**
  Two high-capacity proportional output and three digital outputs are ideal for 2-coil control applications. Outputs can drive up to 5-amp coils directly.

OPERATION

**Input Signal**

Jumper selectable 0 to 5vdc or 0.5 to 4.5vdc input. Use resistor divider (see installation instructions) to accommodate 0 to 10vdc input signal. Use 250-ohm shunt resistor (see installation instructions) to accommodate 4 to 20mA input signal.

**Adjustments**

Min, max, ramp up, ramp down, dither, and threshold (deadband) are adjustable from 0-99% of full-scale range. See specifications for adjustment ranges.

**Outputs**

Proportional and digital outputs can drive up to 5-amp coils directly. Digital output A operates whenever joystick or pot is above threshold (deadband) setting. Digital output B operates whenever joystick or pot is below threshold setting. Digital output AB operates whenever joystick or pot is above OR below threshold setting. Digital output C operates whenever joystick or pot is above threshold, and remains energized until joystick is below minimum threshold (pulled back).

**Manual Operation**

Inputs are provided for toggle switches to manually override or “bump” the output signals without using a joystick or potentiometer.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC200</td>
<td>Dual coil valve driver</td>
</tr>
</tbody>
</table>
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th><strong>General</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power requirement</td>
<td>9-30vdc, 250mA nominal + power to loads</td>
</tr>
<tr>
<td>Fuse</td>
<td>Blade fuse, 15-amp</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Digital Output</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Sourcing</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>Same as supply voltage, 5-amps max</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PWM Output</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>1700Hz</td>
</tr>
<tr>
<td>Dither</td>
<td>100Hz, 0-10% of max current</td>
</tr>
<tr>
<td>Output</td>
<td>Same as supply voltage, 5-amps max</td>
</tr>
<tr>
<td>Adjustments</td>
<td>Min/Max: 0-5-amps</td>
</tr>
<tr>
<td>Ramp up/down: 0.1 to 5 seconds</td>
<td></td>
</tr>
<tr>
<td>Threshold: 0 to 2vdc</td>
<td></td>
</tr>
<tr>
<td>Dither: 0-10%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Analog Input</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Range</td>
<td>0 to 5vdc or 0.5 to 4.5vdc, jumper selectable</td>
</tr>
<tr>
<td>Courtesy Power</td>
<td>+5vdc, 50mA max signal provided for potentiometer</td>
</tr>
<tr>
<td></td>
<td>+2.5vdc, 50mA max provided for tap reference</td>
</tr>
<tr>
<td></td>
<td>1k pot recommended</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Digital Inputs</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Switches</td>
<td>Dry contact - connect “SEND“ to SW1+ or SW1- and SW2+ or SW2-</td>
</tr>
<tr>
<td>Disable*</td>
<td>Connect to power terminal to disable control</td>
</tr>
<tr>
<td>Do not use disable input for safety control</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Dimensions</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>4.8”L x 4.25”W x 1.125”D</td>
</tr>
<tr>
<td>Mounting</td>
<td>4 x #6 self-tapping screws</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Environmental</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>-40ºC to 85ºC</td>
</tr>
<tr>
<td>Operating</td>
<td>-10ºC to 60ºC</td>
</tr>
</tbody>
</table>

* When using 2 controllers with 2-axis joystick, AB(+) output terminal of one controller can be connected to DISABLE terminal of a second controller to prevent simultaneous operation of X and Y axis.

**WIRING EXAMPLES:**

![Wiring Examples Diagrams](attachment:image.png)
Limited One Year Warranty

Miratron is providing this warranty in lieu of all other express or implied warranties, including any warranty of merchantability or fitness for a particular purpose. This warranty is buyer’s exclusive remedy for all claims against Miratron. Miratron shall not be liable for any consequential or incidental damages. Miratron’s total liability for all contracts, negligence, or other claims shall be limited to the price paid for its product.

Miratron promises buyer that any Miratron product purchased by buyer shall be free from all material defects in design, material, or manufacturing for a period of 1 year from the manufacture date; provided, however, that the warranty shall not extend to ordinary wear and tear or to normally replaceable components (e.g., batteries). During the warranty period, Miratron may repair or replace (at its sole discretion) any product suffering from a warranty defect and returned freight prepaid by buyer, with no charge to buyer for any warranty repair or replacement. The warranty shall remain in full force and effect for such 1 year period, provided that the product: (1) was installed, operated, and maintained properly; (2) has not been abused or misused; and (3) has not been repaired, altered, or modified outside of Miratron’s authorized facilities. This warranty provides specific legal rights that may be varied by state law.

Miratron products are not designed for life or safety applications.

Product specification subject to change without any notice.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electronic products must be physically disconnected from the equipment prior to welding. Welding may cause permanent damage to sensitive electronic components, and will void this warranty.</strong></td>
</tr>
</tbody>
</table>
Terms and Conditions

Our terms and conditions apply to all orders. We do not accept any deviations from our terms. If your P.O. or other correspondence lists terms that are different from ours, we may process your order, but we do not accept the terms. We reserve the right to change our terms and conditions of sale at any time and without prior notice. Our terms and conditions in effect on the day an order is accepted shall apply without deviation. If you have any questions about whether the terms and conditions in this document are still in effect, please inquire at the time you place your order. All orders are subject to acceptance by us at our Miratron headquarters.

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Receiving Shipments: Please inspect all deliveries promptly. You must notify us within 48 hours of receipt with reported discrepancies or shortages.

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Delivery Dates: Miratron does not guarantee delivery dates. Shipping dates given by Miratron prior to shipment are estimated only, and Miratron shall not be liable for failure to meet such dates for any reason, including delays in or failure of delivery by a manufacturer resulting from product shortages or other manufacturing delays or causes beyond Miratron’s reasonable control.

Changes to Orders: We try to accommodate order changes if possible, up to the point of shipment. After shipment, standard catalog product may be exchanged, returned for credit, or subject to restocking per Miratron policies. Custom product cannot be returned except under the terms of our Warranty.

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Representations: Miratron makes no representations with respect to compliance with project specifications. Any agreement of sale and/or quotation represents Miratron's best interpretation of any applicable project and the material required for the project based on specifications and/or schedules provided to us by the Purchaser or by Custom Survey. Any change to said specifications and/or schedules would void the sale and/or quotation at Miratron’s option. Miratron will not be liable for omissions from, nor any labor or material charges resulting from a misinterpretation, or the project requirements or information provided for the materials, regardless if the information was provided by the Purchaser or not. Miratron is not responsible for verification of electrical compatibility, compliances, or for any other options or variation of products. It is the responsibility of the Purchaser to determine and verify these items and any other pertinent information required to supply each particular project per plans and specifications.

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What’s New

✔ Improved and expanded belly-pack designs for demanding applications in harsh and classified areas.

✔ CAN compatible radio controls and input modules for switches and proportional controls.

✔ Smart fan controls with soft-start and fault monitoring. Improve cooling system performance and protect equipment.

Mission
To improve the performance of hydraulic equipment by providing innovative electronic controls products

Core Competencies
• Radio remote control
• Electronic controls products design
• DC mobile applications - harsh and demanding environments
• High reliability design for safety
• Qualified technical application support

Did You Know?
Miratron radios are designed, built, and programmed especially for each customer. You can select the transmitter style, choose the combination of controls, customize the layout, and even choose the color and add a logo! Miratron transmitters & receivers are “mix and match”, so you can pick the best combination for your application. Check out our configuration guide to see how easy it is to design your own radio!

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FAX: (503) 217-6060
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