



INDUSTRIAL RADIO CONTROLS



2016 Product Catalog

**Unwire
Your World**

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www.miratron.com

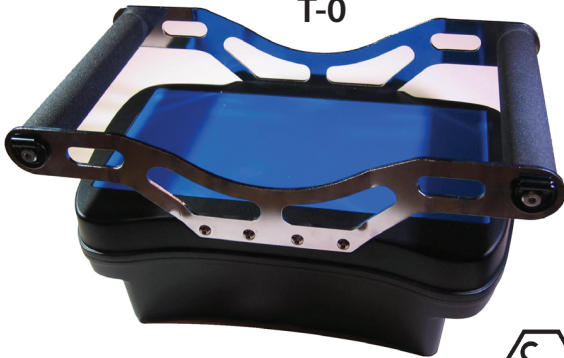


Radio Remote Control Product Selector

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

TRANSMITTER MODELS

T-0



NOW AVAILABLE

Our largest and most rugged belly pack yet! The best choice for harsh environments and projects requiring many control devices.

T-1 and T1-XL



NOW AVAILABLE



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 arm or waist strap or belt clip. Ideal for toggles or pushbuttons.

T-5sm



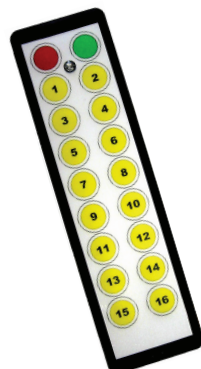
Handheld keypad with custom printed legend. Rubber boot, zipper pouch, and belt clip options.

T-7sm



Ruggedized keypad remote with up to 10 buttons.

T-7



Ruggedized keypad remote with up to 18 buttons.

TZM-10



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

MICROLINK



Short-range, fixed frequency miniature and keyfob.

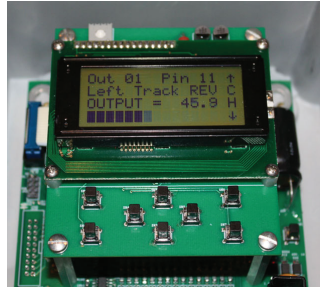
Radio Remote Control Product Selector

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



RECEIVER MODELS

R-1 / R-2



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.

R-3



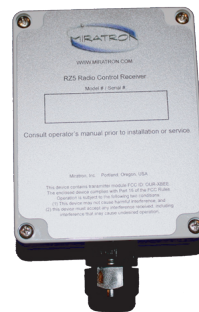
Choose 14 or 28 relays, and up to 2 proportional outputs. Rugged NEMA 4 enclosure with Deutsch connector.

R-4 / R-4 P / 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-function 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.



T-0 Jumbo Belly Pack Transmitter



NOW 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 option available. Batteries are easily accessible.

ORDERING INFORMATION

PART #	DESCRIPTION
TX0	Standard range belly pack transmitter
TE0	Extended range belly pack transmitter
TZ0	International belly pack transmitter

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

SPECIFICATIONS

Transmitter

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
Range (line of sight)	Standard range = 500 feet Extended range = 1500 feet International = 500 feet
RF Power Output	Standard range = 5mW Extended range = 100mW International = 60mW (100mW EIRP)
Battery Type	3 "D" size alkaline or rechargeable
Battery Life (Alkaline)	Standard range = Standby, 80 hrs; Transmit, 35 hrs Extended range = Standby, 20 hrs; Transmit, 8 hrs International = Standby, 15 hrs; Transmit, 6 hrs
Controls	User specified toggles, joysticks, potentiometers, or paddles
Led Indicator	Flashing = normal; Double blink = battery low
Belly Pack	High-impact urethane, Polane urethane paint finish Plated or powder coated steel guard plates Stainless steel, rubber insulated hand rails
Dimensions	11-1/4" L x 5-1/2" W x 6-1/2" D
Weight	Under 10 lbs. with batteries for average configuration
Sealing	IP65
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

Enclosure

Environmental:



T-1 Multi-Function Belly Pack Transmitter



NOW AVAILABLE

Fully Customizable Controls



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.

ORDERING INFORMATION

PART #	DESCRIPTION
TX1	Standard range belly pack transmitter
TE1	Extended range belly pack transmitter
TZ1	International belly pack transmitter
TR1	Infrared belly pack transmitter

Add “-XL” suffix for jumbo belly pack option.

Add “-EX” suffix for explosion proof version. Consult factory.

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.

NEW Improved Design!

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

SPECIFICATIONS

Transmitter

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
Range (line of sight)	Standard range = 500 feet Extended range = 1500 feet International = 500 feet Infrared = 50 feet
RF Power Output	Standard range = 5mW Extended range = 100mW International = 60mW (100mW EIRP)
Battery Type	3 "D" size alkaline or rechargeable
Battery Life (Alkaline)	Standard range = Standby, 80 hrs; Transmit, 35 hrs Extended range = Standby, 20 hrs; Transmit, 8 hrs International = Standby, 15 hrs; Transmit, 6 hrs
Controls	User specified toggles, joysticks, potentiometers, or paddles

Enclosure

Led Indicator	Flashing = normal; Double blink = battery low
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:

Sealing	IP65
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.



Transmitters for Hazardous Locations



T-0 jumbo



T-1 XL large



T-1 standard



NOW AVAILABLE

FEATURES

■ Safety

Miratron transmitters approved for use in hazardous locations are intrinsically safe.

■ Customizable

Approved transmitters can be customized with many combinations from our wide range of approved controls at minimal cost.

■ Rugged Construction

Robust housings and controls have been tested to withstand harsh environmental conditions and heavy use. Metal guard-rail options are also available for added durability.

APPROVALS

U.S. NEC / CANADA CEC

Intrinsically Safe for

Class I, Division 1, Groups C, D T3

Class I, Zone 0, AEx ia IIB

Ta = -20degC to 52degC; IP65

IECEx and ATEX

II 1 G Ex ia IIB T3

Ta = -20°C ≤ Ta ≤ +52°C; IP65

APPLICATIONS

■ Oil and gas equipment

■ Tunneling equipment

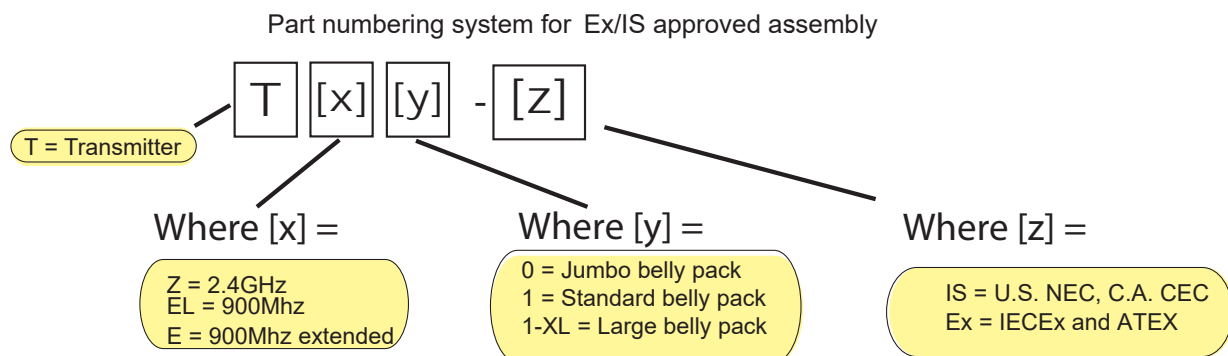
■ Railroad

■ Military vehicles

■ Robotics

■ Excavating equipment

ORDERING INFORMATION





IS and EX Belly Pack Transmitter



NOW AVAILABLE



OPERATION

Radio Operation

Models available with outdoor range of 1500 feet or more! spread spectrum 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 Duracell MN1300 "D" cell batteries. Batteries are easily accessible.

ORDERING INFORMATION

PART #	DESCRIPTION
TEL	Standard range belly pack transmitter
TE	Extended range belly pack transmitter
TZ	International belly pack transmitter

Add "-IS or -Ex" suffix for intrinsically safe versions. Consult factory for more information.

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 applications.

☒ Tether (IS and Ex Models not certified for use on 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 on standard Duracell MN1300 "D" cell alkaline. No downtime waiting for specialty battery packs to charge.

APPLICATIONS

☒ Oil field equipment

☒ Tunneling equipment

☒ Railroad

☒ Military vehicles and robots

☒ Excavating equipment

SPECIFICATIONS

Transmitter

Frequency	902-928MHz, Unlicensed ISM band standard models 2.4-2.4835GHz, Unlicensed ISM band international option
Type	Spread Spectrum
Frequency Control	Direct FM
FCC id	MCQ-XB900HP: Standard range MCQ-XB900HP: Extended range OUR-XBEEPRO: International version
Range (line of sight)	Standard range = 500 feet Extended range = 1500 feet International = 500 feet
RF Power Output	Standard range = 60mW Extended range = 125mW International = 60mW (100mW EIRP)
Battery Type	3 Duracell MN1300 "D" size alkaline
Battery Life (Alkaline)	Standard range = Standby, 30 hrs; Transmit, 12 hrs Extended range = Standby, 20 hrs; Transmit, 8 hrs International = Standby, 15 hrs; Transmit, 6 hrs
Controls	User specified toggles, joysticks, potentiometers, or paddles
Led Indicator	Flashing = normal; Double blink = battery low
Weight	Under 10 lbs. with batteries for average configuration
Sealing	IP65

Enclosure

Environmental:

Operating (EX rated models)	-20°C to 52°C
Battery operating range:	Alkaline (Duracell), -20°C to 54°C

SPECIFICATIONS

Transmitter

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
Range (line of sight)	Standard range = 500 feet Extended range = 1500 feet International = 500 feet
RF Power Output	Standard range = 5mW Extended range = 100mW International = 60mW (100mW EIRP)
Battery Type	4 "AA" size alkaline or rechargeable
Battery Life (fully charged)	Standard range = Standby, 40 hrs; Transmit, 16 hrs Extended range = Standby, 10 hrs; Transmit, 4 hrs International = Standby, 8 hrs; Transmit, 3 hrs
Controls	User specified toggles, potentiometers, mini-joystick/sliders, LCD
Led Indicator	Flashing = normal; Double blink = battery low

Enclosure

Compact Console	High-impact ABS Approximate size: 7" L x 3-1/2"W x 4-1/4"D including rails
Sealing	IP65

Environmental

Storage	-40°C to 85°C
Operating	-10°C to 60°C



Compact console includes waist and neck straps.



Sealed battery compartment is easily accessible.



Control a chipper or crusher from the cab of the loader.



T-2 Multi-Function Compact Console Transmitter

Fully Customizable Controls



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.

ORDERING INFORMATION

PART #	DESCRIPTION
TX2	Standard range compact console transmitter
TE2	Extended range compact console transmitter
TZ2	International compact console transmitter

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



T-3 Multi-Function Handheld Transmitter

Toggle Switches, Pushbuttons, and Proportional Trigger Option



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.

ORDERING INFORMATION

PART #	DESCRIPTION
TX3	Standard range hand grip transmitter
TE3	Extended range hand grip transmitter
TZ3	International hand grip transmitter

Add "-TR" suffix for 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

SPECIFICATIONS

Transmitter

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
Range (line of sight)	Standard range = 500 feet Extended range = 1500 feet International = 500 feet
RF Power Output	Standard range = 5mW Extended range = 100mW International = 60mW (100mW EIRP)
Battery Type	3 "AA" alkaline or rechargeable (4 "AAA" for TE3)
Battery Life (fully charged)	Standard range = Standby, 40 hrs; Transmit, 16 hrs Extended range = Standby, 10 hrs; Transmit, 4 hrs International = Standby, 8 hrs; Transmit, 3 hrs
Controls	User specified toggles, pushbuttons, potentiometers, trigger
Trigger (option)	Non contact GMR type

Enclosure

Led Indicator	Flashing = normal; Double blink = battery low
Hand Grip	High-impact polystyrene, UL94HB Approximate size: 8" L (inc'l handle) x 4-1/2"W x 4"D

Environmental

Sealing	IP54 up to IP65
Storage	-40°C to 85°C
Operating	-10°C to 60°C



Compact hand-grip is comfortable to hold and operate.



Optional trigger provides smooth proportional control.



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

PART #	DESCRIPTION
TX4	Standard range ergo transmitter
TE4	Extended range ergo transmitter
TZ4	International ergo transmitter

SPECIFICATIONS

Transmitter

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
Range (line of sight)	Standard range = 500 feet Extended range = 1500 feet International = 500 feet
RF Power Output	Standard range = 5mW Extended range = 100mW International = 60mW (100mW EIRP)
Battery Type	4 "AA" size alkaline or rechargeable
Battery Life (fully charged)	Standard range = Standby, 40 hrs; Transmit, 16 hrs Extended range = Standby, 10 hrs; Transmit, 4 hrs International = Standby, 8 hrs; Transmit, 5 hrs
Controls	User specified toggles, pushbuttons, or potentiometers
Led Indicator	Flashing = normal; Double blink = battery low
Ergo arm/waist pack	High-impact polystyrene, UL94HB Approximate size: 6" L x 4"W x 2"D
Sealing	IP54
Storage	-40°C to 85°C
Operating	-10°C to 60°C

Enclosure

Environmental



Optional external antenna
for added range.



Optional belt clip.



Great for bark blower trucks.



T-5 Compact Keypad Remote Controls

Up to 11 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.

OPERATION

Radio Operation

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

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

ACCESSORIES

Weather resistant bag with wrist strap

Belt clip

Rubber protective boot



Weather bag and belt clip options.

APPLICATIONS

Tow trucks

Hydraulic equipment

Winches

Concrete pumps

Conveyors

Earth compactors

Rock crushers

Robotics

Remote process control

Cranes

Specialty off-highway equipment

ORDERING INFORMATION

PART #	DESCRIPTION
TF5-SM	Small size 433MHz keypad transmitter, 100' range

SPECIFICATIONS

Transmitter

Frequency	TZ5: 2.4-2.4835GHz, Unlicensed ISM band TF5/TF5-SM: 433MHz
Modulation	TZ5: ZigBee™ 802.15.4 TF5/TF5-SM: ASK/OOK
Range	TZ5: 300' line of sight TF5/TF5-SM: 100' line of sight
RF Power Output	TZ5 = 60mW, nominal TF5/TF5-SM = 1mW
Battery Type	TZ5/TF5: 9-volt alkaline TF5-SM: 2 "AAA" alkaline
Led Indicator	Flashing or Solid (application specific) = normal
Dimensions	TZ5/TF5: 5.5" x 2.5" x 1.2" TF5-SM: 3.78" x 1.85" x 0.95"
Storage	-40°C to 85°C
Operating	-10°C to 60°C

Enclosure

Environmental

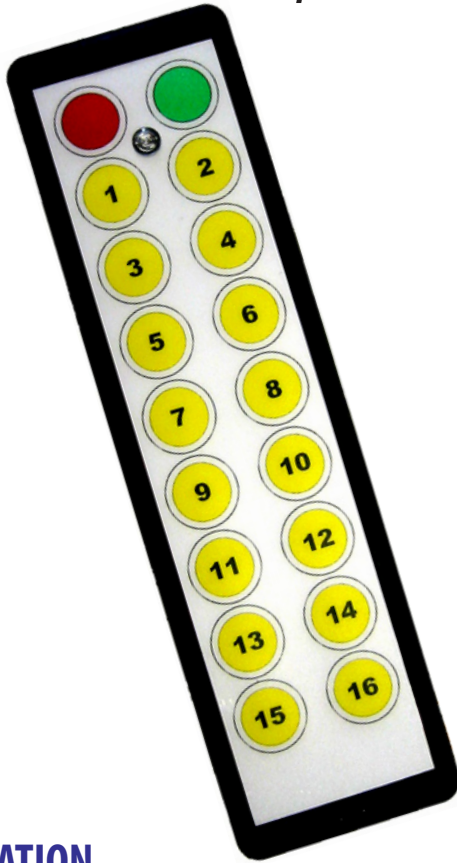
Compact, handheld keypad transmitter is ideal for cost-sensitive applications!





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)



Tether option shown includes 3-meter cable.

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

PART #	DESCRIPTION
TZ7	2.4GHz FHSS keypad transmitter, 300' range
TF7	433MHz keypad transmitter, 100' range

APPLICATIONS

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

SPECIFICATIONS

Transmitter

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

Enclosure

Environmental

Also available as a hard wired pendant control!



Other pushbutton and toggle switch arrangements are also possible.





R-1 1 to 32 Channel Adjustable Receiver

LCD and pushbutton interface for field adjustment



NEW

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

OPERATION

Radio Operation

Up to 32 factory installed outputs can be any combination of digital (bang/bang), proportional current, ratiometric, or unamplified. Adjustable min, max, ramp times, and threshold. Can directly drive a wide range of coils and other DC loads. Other customer specified parameters can be field adjusted.

User Interface

Pushbutton and LCD display menu system enables field setup and adjustment of customer specified parameters. Menu system can be locked to prevent accidental adjustment by end-user. System performance and status messages are also displayed.

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.

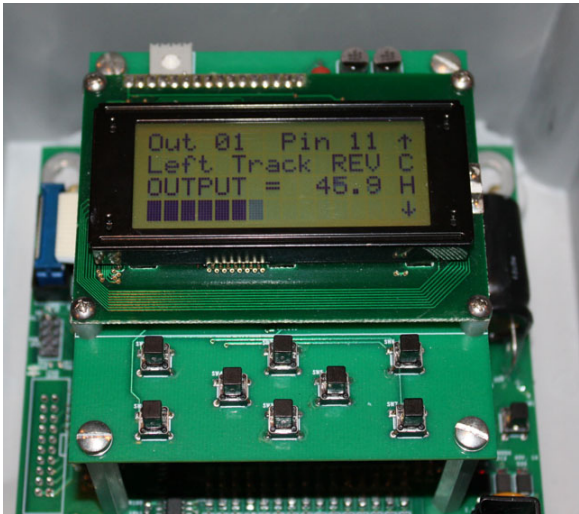
*Backlit LCD Display!
Easily make adjustments to
tune machine performance.*

ORDERING INFORMATION

PART #	DESCRIPTION
RX1	Standard range universal receiver kit
RE1	Extended range universal receiver kit
RZ1	International universal receiver kit

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)
Interface	Standard Adjustments	Min, Max, Ramp up, Ramp down, Threshold
	Field Wiring	40-position Deutsch connector with 6' pigtail wiring
	Keypad	8-pushbuttons
	LCD	4-line x 16 character backlit LCD
Enclosure		IP67 fiberglass
Environmental	Storage	-40°C to 85°C
	Operating	-10°C to 60°C



Built-in programming interface. Ideal for fine tuning maching 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

PART #	DESCRIPTION
RX2	Standard range universal receiver kit
RE2	Extended range universal receiver kit
RZ2	International universal receiver kit

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
Receiver	Sensitivity	-104dBm
	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)
Enclosure	Field Wiring	40-position Deutsch connector with 6' pigtail wiring
		IP67 fiberglass
Environmental	Storage	-40°C to 85°C
	Operating	-10°C to 60°C



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



NEMA 4X polycarbonate option shown

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

ORDERING INFORMATION

PART #	DESCRIPTION
RX3	Standard range relay receiver
RE3	Extended range relay receiver
RZ3	International relay receiver

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 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
	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		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



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.

ORDERING INFORMATION

PART #	DESCRIPTION
RX4	Standard range 16 channel receiver
RE4	Extended range 16 channel receiver
RZ4	International 16 channel receiver

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.

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

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 to10v, typical)
Enclosure	Inputs	Up to 7 factory configurable inputs, 55vdc max.
	Field Wiring	1 or 2, 12-pin DTM connector with 6' pigtail cable
		Nylon 6/6 black, IP66 Approximate size: 5.24" L x 4.63"W x 1.48"D
Environmental	Storage	-40°C to 85°C
	Operating	-10°C to 60°C



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



Shown with optional tether connector and external antenna jack

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.

ORDERING INFORMATION

PART #	DESCRIPTION
RX4-CAN	Standard range CAN receiver
RE4-CAN	Extended range CAN receiver
RZ4-CAN	International CAN receiver

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.

APPLICATIONS

■ Remote process control

■ Specialty off-highway equipment

■ Crane control

■ Sawmill machines

■ Conveyors

■ Earth compactors

■ Rock crushers

■ Robotics

■ Wood chippers and grinders

■ Winch systems

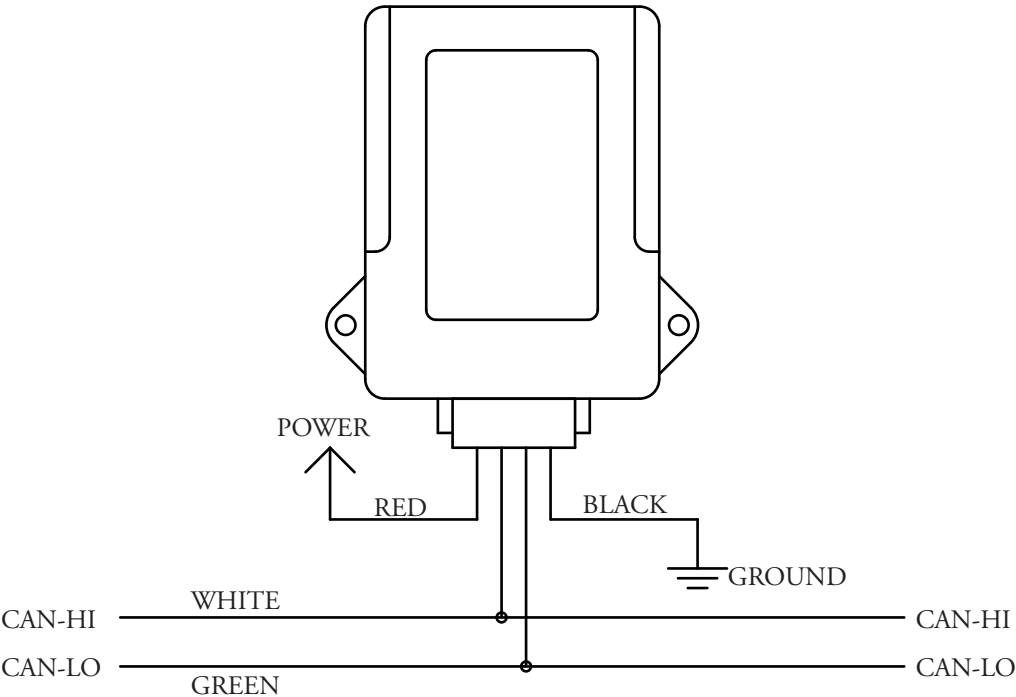
SPECIFICATIONS

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
	Field Wiring	Consult factory for available protocols and message specifics 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	-40°C to 85°C
	Operating	-10°C to 60°C

POINT MAP

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

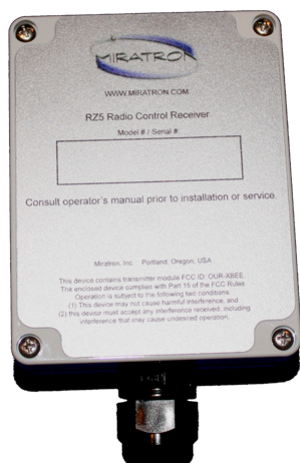
WIRING





R-5 / R-5-24 16 and 24 Channel Basic Receiver

Up to 16 or 24 Functions Latching or Momentary



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.

SPECIFICATIONS

General

Power Requirement 12vdc, 100mA nominal + power to loads
24vdc version available

Fuses 10-amp mini blade fuse

Radio

Frequency RZ5: 2.4-2.4835GHz, Unlicensed ISM band international option
RF5: 433MHz, fixed frequency

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.

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.

ORDERING INFORMATION

PART #	DESCRIPTION
RZ5	2.4GHz receiver, 16 channel
RF5	433MHz receiver, 16 channel
RZ5-24	2.4GHz receiver, 24 channel
RF5-24	433MHz receiver, 24 channel



R-6 1 to 3 and 4 to 7 Channel Potted Receivers

Potted Modules with Popular Deutsch DT Connector



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.

ORDERING INFORMATION

PART #	DESCRIPTION
RF6-SM	433MHz potted receiver, 1, 2, or 3 channels
RF6	433MHz potted receiver, 4, 5, 6, or 7 channels

SPECIFICATIONS

General

Power Requirement 12vdc, 100mA nominal + power to loads

Radio

Fuses Customer-supplied fuse should be installed in field wiring

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

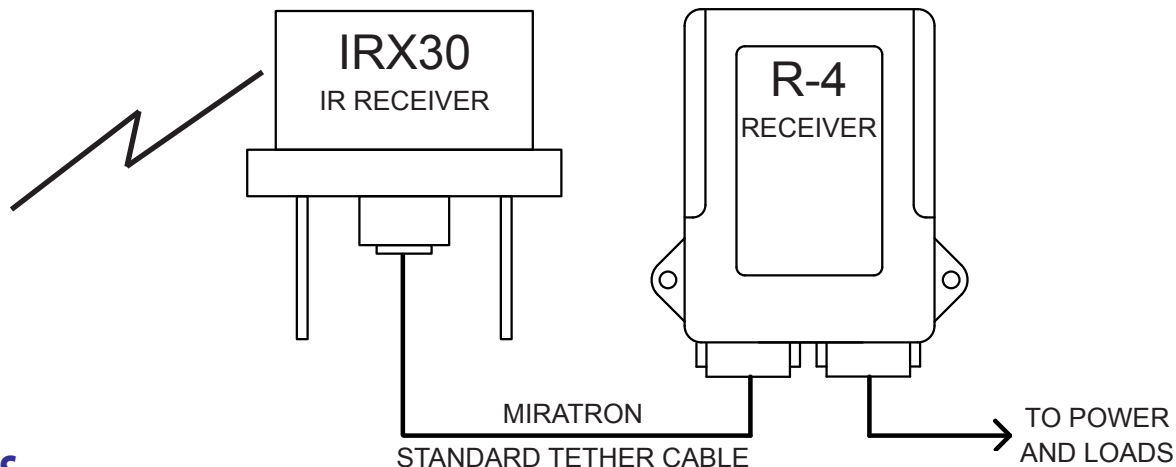
Connects directly to the tether jack on our most popular receivers.
Compatible with all IR equipped Miratron transmitters.

ORDERING INFORMATION

PART #	DESCRIPTION
IRX30	Infrared receiver module

APPLICATION

MIRATRON
IR-EQUIPPED
TRANSMITTER



SPECIFICATIONS

General

IR

Power Requirement	Powered from receiver
Wavelength	950nm infrared
Range	50 feet, nominal

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.

ORDERING INFORMATION

PART #	DESCRIPTION
IRX2	Infrared receiver, 2-Channel

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



RECEIVER ACCESSORIES

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

PART #	DESCRIPTION
R-EXP-4	Expansion module with cable

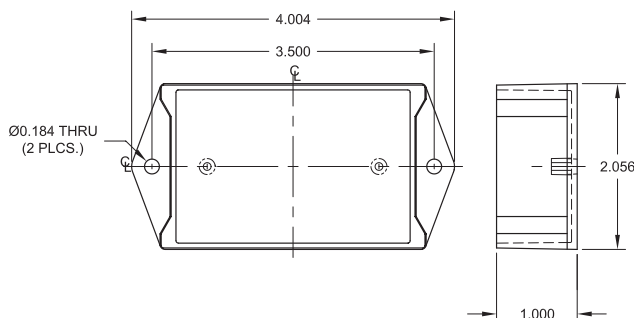
LAM 72x - Controls Linear Actuators from Radio Receiver Outputs

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



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

PART #	DESCRIPTION
LAM720	Bang/bang controller
LAM722	Proportional position controller with feedback



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.





TZM10/RZM10 Compact radio modules

Radio remote control modules with 2 analog/proportional channels



The TZM10/RZM10 is a simple, cost-effective way to add wireless control to almost any equipment.

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.

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.

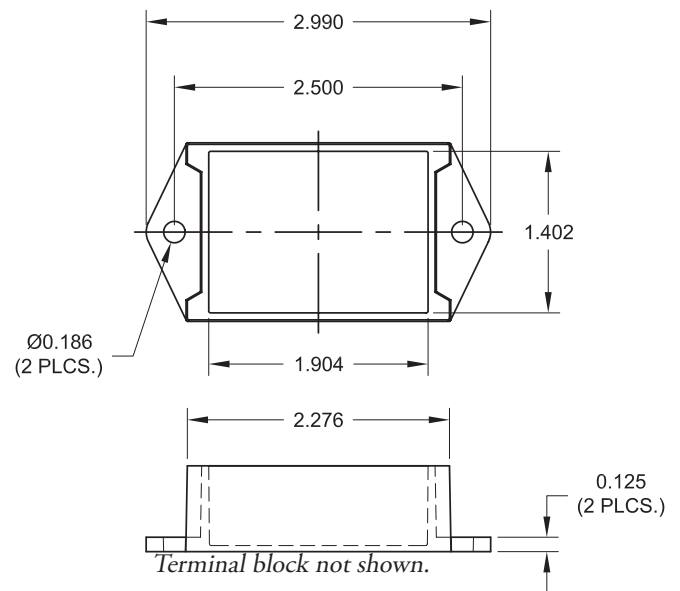
■ Rugged Construction

Robust potted module keeps electronics protected.

■ License Free

Pre-certified FCC - no license required.

DIMENSIONS



ORDERING INFORMATION

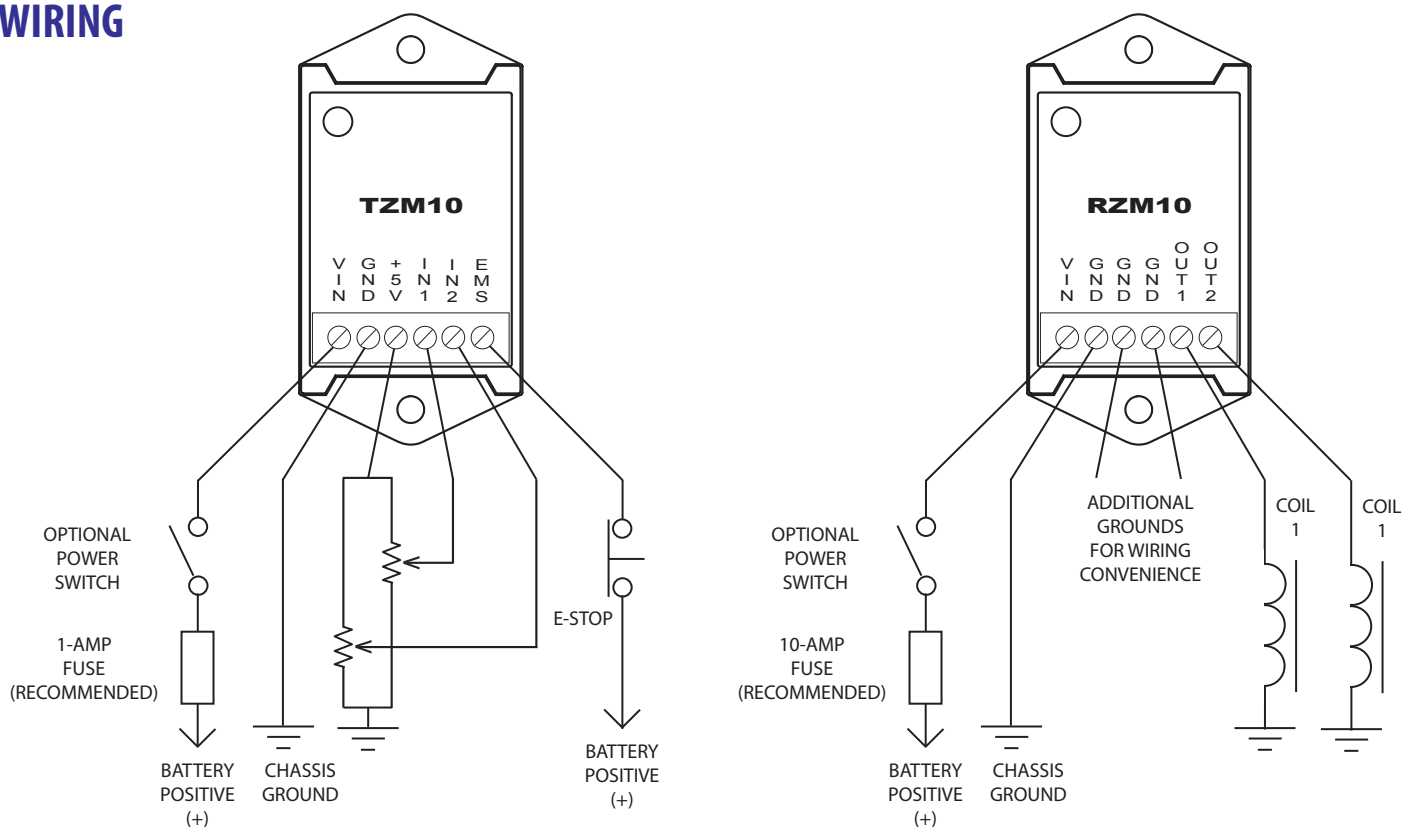
PART #	DESCRIPTION
TZM10	Transmitter module, 2.4GHz, 300 ft. range
RZM10	Receiver module, 2.4GHz, 300 ft. range

SPECIFICATIONS

Transmitter	Inputs	2 analog or digital (0-5vdc); 1 E-Stop (EMS)
	Frequency	2.4-2.4835GHz, Unlicensed ISM band
	Modulation	ZigBee™ 802.15.4
	Range	300' line of sight
	RF Power Output	60mW, nominal
	Power	12VDC, 100mA max.
Enclosure	Led Indicator	Flashing or Solid (application specific) = normal
		ABS Potted module, 3.0" L x 1.6" W x 1" H
Environmental	Storage	-40°C to 85°C
	Operating	-10°C to 60°C

Receiver	Power Requirement	12vdc, 100mA nominal + power to loads
	Fuses	Customer-supplied fuse should be installed in field wiring
	Outputs	2 proportional PWM current (can be used as on/off)
	Dropout delay	1/2 second
Enclosure		ABS Potted module , 3.0" L x 1.6" W x 1" H
	Storage	-40°C to 85°C
Environmental	Operating	-10°C to 60°C

WIRING





MOTOR LINK Keyfob Remote Motor Controller

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



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

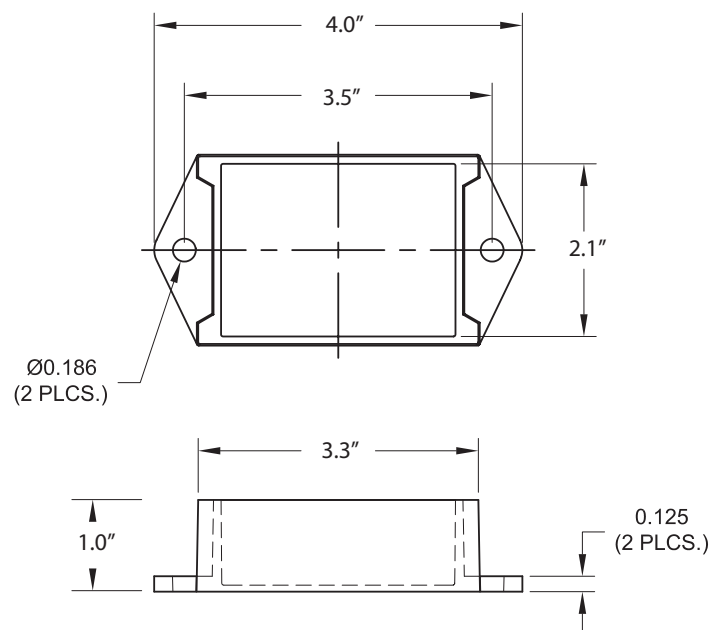
ORDERING INFORMATION

PART #	DESCRIPTION
ML433-KF2	Keyfob transmitter, 2-button
RFM10-MOT	Receiver module with motor control output and override input

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.

DIMENSIONS

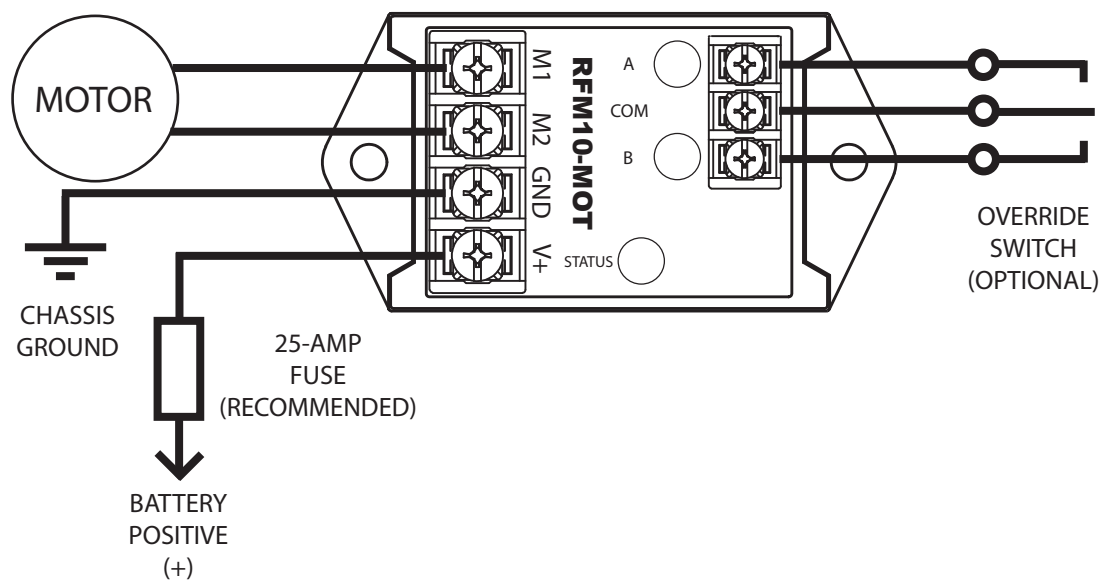


Terminals (not pictured) add additional height.

SPECIFICATIONS

Transmitter	Frequency	433MHz
	Frequency Control	FM
	Range	Keyfob transmitter: 50-100' outdoor line of sight
	RF Power	1mW, nominal
Receiver	Battery Type	3-volt lithium coin cell, CR 2032
	Power Requirement	12vdc, 50mA max plus motor load current
	Antenna	Built-in, (external option)
	Output type	25-amp, Solid state
Dimensions	Field Wiring	Terminal blocks
	Overall	4.0" L x 2.1" W x 1" H
Environmental	Mounting	Molded-in mounting tabs. Hardware included.
	Sealing	Potted electronic module
	Storage	-40°C to 85°C
	Operating ambient temperature	-10°C to 50°C

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

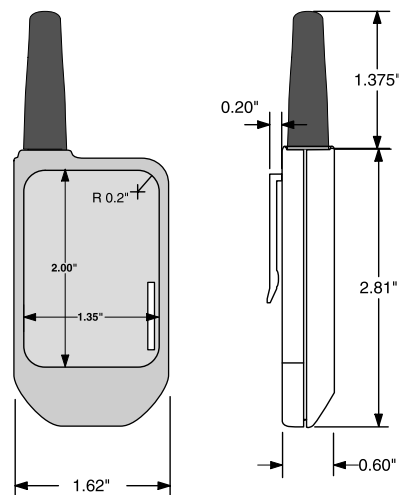
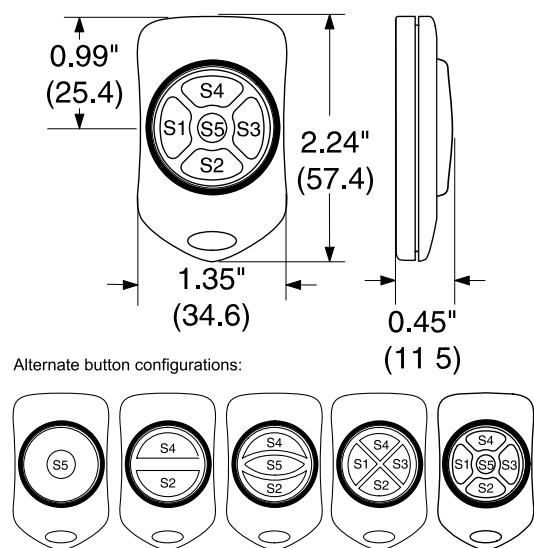
DIP switch selectable radio address permits multiple radios to be used in the same area without causing false control.

ORDERING INFORMATION

PART #	DESCRIPTION
ML433-KF4	Keyfob transmitter, 4-button
ML433-CT4	Compact transmitter, 4-function/8-button (4 on/4 off)
ML433-RX4	Receiver, 4 function (momentary or latching)

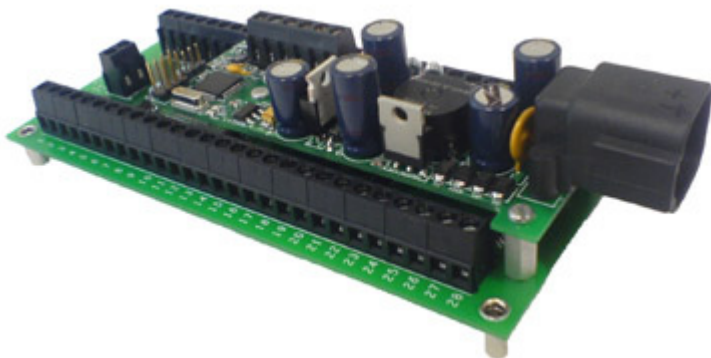
SPECIFICATIONS

Transmitter	Frequency	433MHz
	Frequency Control	FM
	Range	Keyfob transmitter: 20-50' outdoor line of sight Compact transmitter: 50-100' outdoor line of sight
	RF Power	1mW, nominal
Receiver	Battery Type	3-volt lithium coin cell, CR 2032
	Power Requirement	ML433-RX4: 12-30vdc, 250mA max
	RF Output	Built-in antenna
	Relays	5-amp, SPDT (FormC)
	Field Wiring	Terminal blocks
	Relay Mode	Factory set for latching or momentary operation
Environmental	Packaging	Plastic housing, not sealed
	Dimension	ML433-RX4: 5.77" x 3.2" x 1.77"
	Storage	-40°C to 85°C
	Operating	-10°C to 60°C





CAN transceiver interface to switches and controls



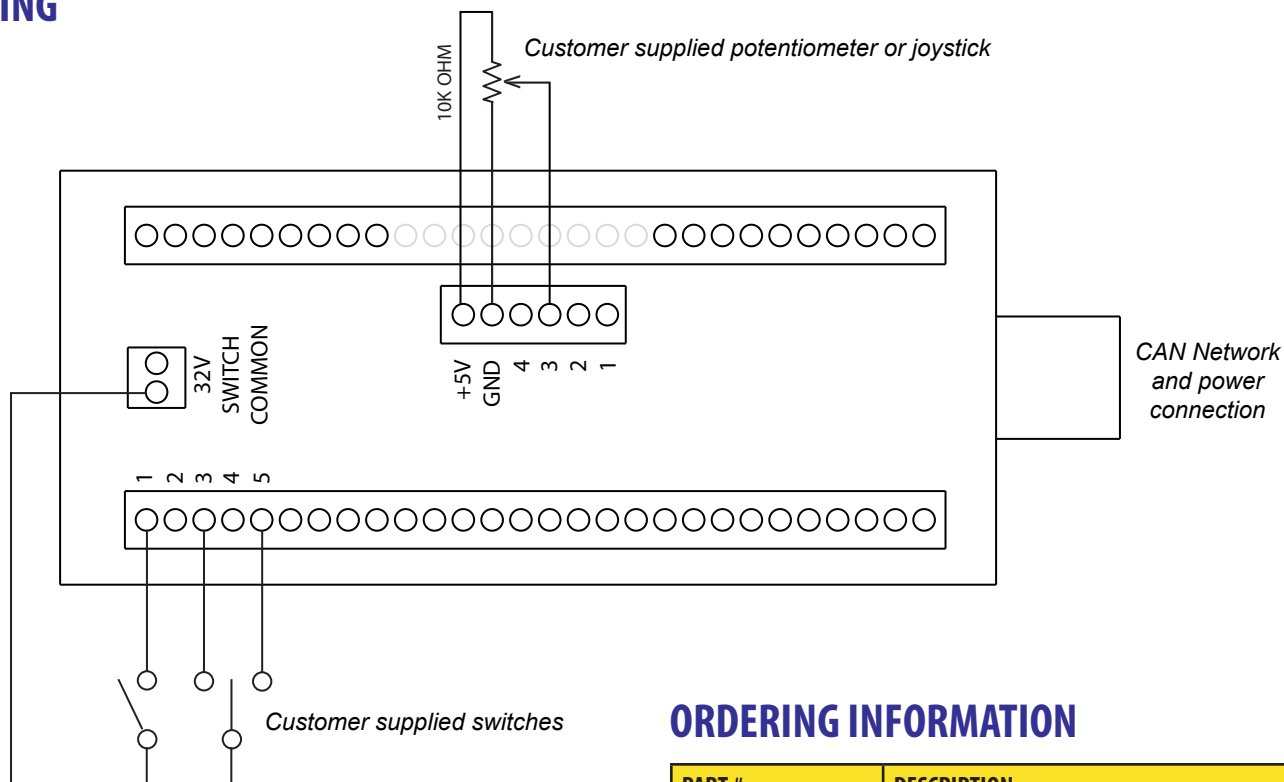
APPLICATIONS

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

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.

WIRING

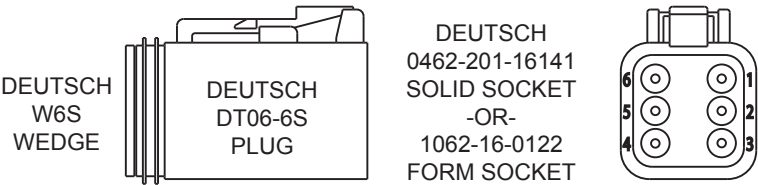


ORDERING INFORMATION

PART #	DESCRIPTION
CANSWTB	Terminal block for field wiring customer switches

Consult factory for available protocols.

WIRING



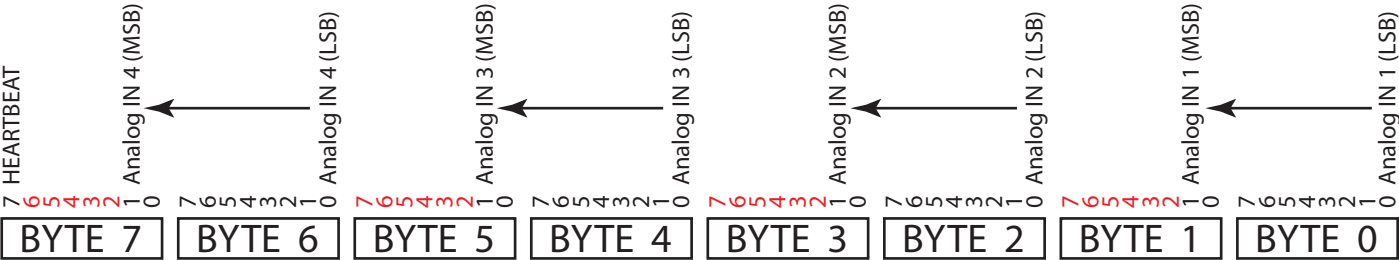
PIN	CANBUS
1	GROUND - NEGATIVE
2	BATTERY + POSITIVE
3	CAN HI
4	CAN LO
5	CAN SHIELD
6	NO CONNECT

POINT MAP

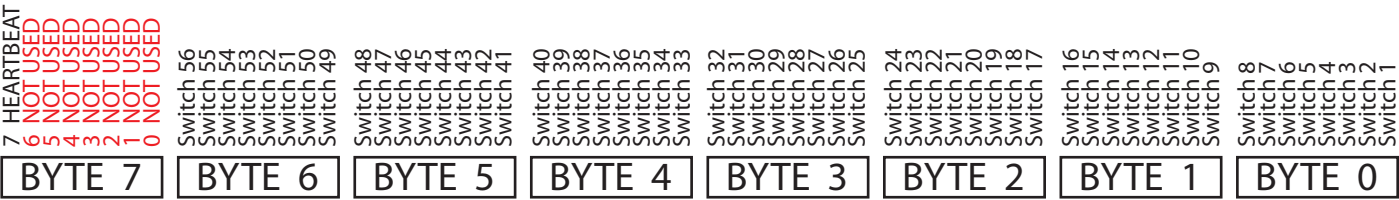
Address: 11 or 29 bits factory set - consult factory for specific requirements

Data Rate: 250kbps; update 20 times per second

Address 0x96 (150 decimal)



Address 0x97 (151 decimal)



Byte 7 reserved, TBD

Heartbeat output changes state every update. Controller should be programmed to monitor this output for fault detection.

SPECIFICATIONS

General	Power requirement	12-30vdc, 50mA nominal
	Fuse	Self-resetting
Inputs	Digital	Up to 56 dry contact inputs 32-volt switch excitation voltage provided
	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



SS200 Dash Mounted Speed Switch

Tachometer, Hour Meter, Volt Meter, Automatic Feed Controller



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.



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

ORDERING INFORMATION

PART #	DESCRIPTION
SS200	Dash mount tachometer and feed controller
SS200-ICT	Infrared commissioning tool

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.

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
Performance	Frequency Range	10 to 10,000Hz
	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	-40°C to 85°C
	Operating	-10°C to 60°C

MODES

		RPM		
MODE	OUTPUT	BELOW LOW-SET	BETWEEN LOW AND HIGH	ABOVE HIGH-SET
0	OUT1	ON	DEADBAND	OFF
	OUT2	NOT USED	NOT USED	NOT USED
1	OUT1	OFF	DEADBAND	ON
	OUT2	ON FOR REV TIME	OFF	OFF
2	OUT1	OFF	DEADBAND	ON
	OUT2	ON	DEADBAND	OFF
3	OUT1	ON	DEADBAND	OFF
	OUT2	ON	DEADBAND	OFF

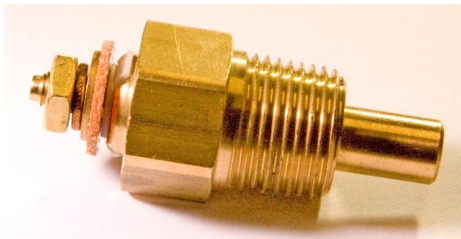
DEADBAND: Output remains in previous state. If RPM is increasing, output stays in “below low-set” state. If RPM is decreasing, output stays in “above high-set” state.

Other factory programmable modes possible.



FC100 Proportional fan control thermostat

Smart controller with fault detection



The FC100 is an affordable, full featured proportional fan controller that is reliable and easy to use.

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%.

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.

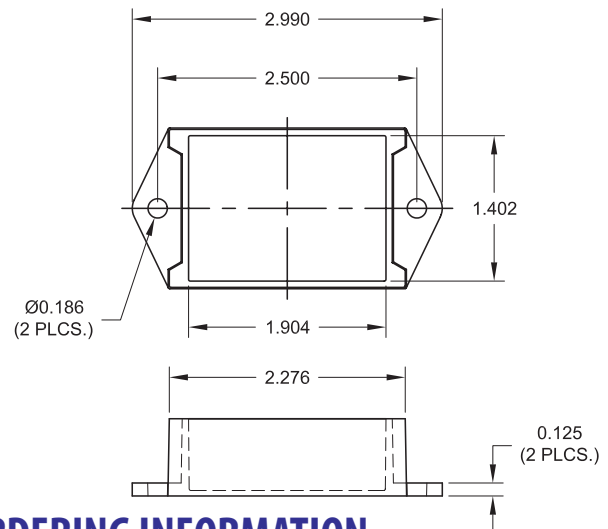
■ Fault Detection

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.

DIMENSIONS



ORDERING INFORMATION

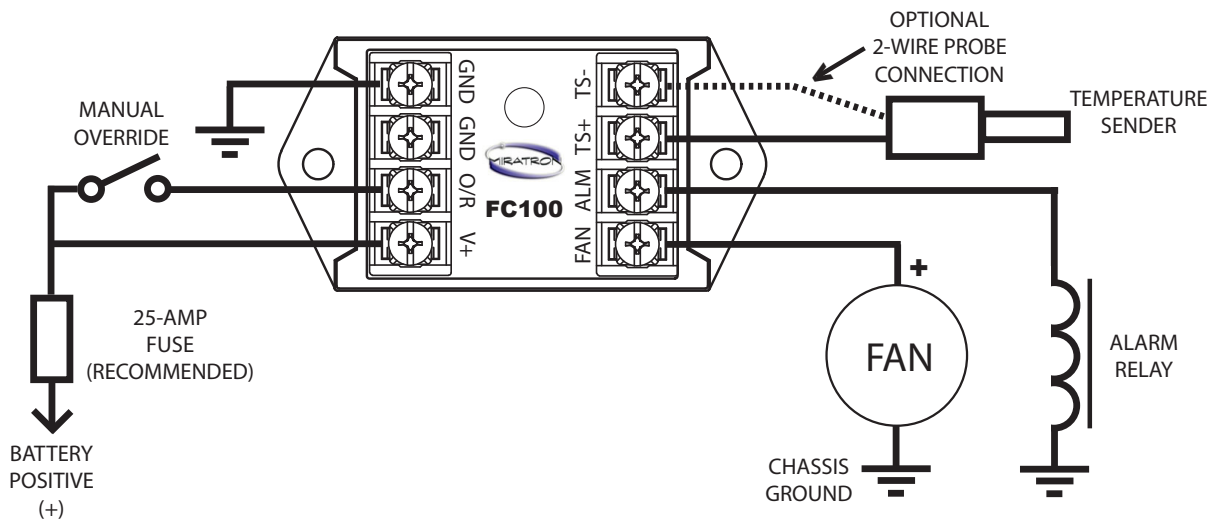
PART #	DESCRIPTION
FC100	Fan Controller Module with temperature sender included
TS10	Temperature sender probe only
FCB	Fan Controller mounting bracket only

Consult factory for compatibility with other temperature senders.

SPECIFICATIONS

General	Power Requirement	12-24vdc, 100mA nominal + power to FAN	
	Fan	Solid-State proportional output. 25-Amps Max. Output de-energized on overcurrent (>30 amps) fan condition. Reset power to retry.	
Outputs	Alarm	Solid-State open collector, positive output. 0.5-Amp Max. Alarm output energized on fault or above high temperature limit.	
	Operation	130degF = ramp to 100%, 120degF = off. Other setpoint temperatures possible. Consult factory.	
Control Range	High Temperature Limit	185degF Alarm output energized.	
	Temperature	For use with Datcon 02024-00 (Miratron TS10)	
Inputs	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
Overall			3.0" L x 1.6"W x 1"H
Mounting			Hardware included. Optional mounting bracket available.
Sealing			Potted electronic module
Dimensions	Storage	-40°C to 85°C	
	Operating ambient temperature (FS100 controller temperature only)	-10°C to 50°C	
Environmental			

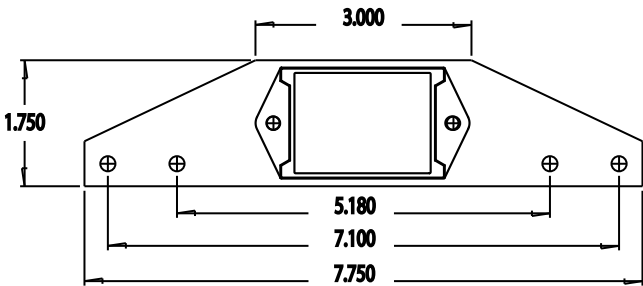
WIRING



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)

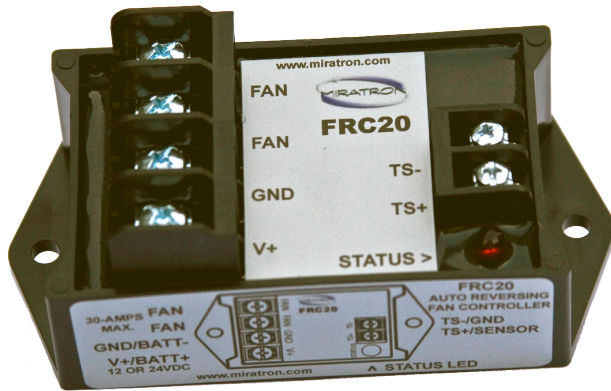
Optional mounting bracket (FCB)





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

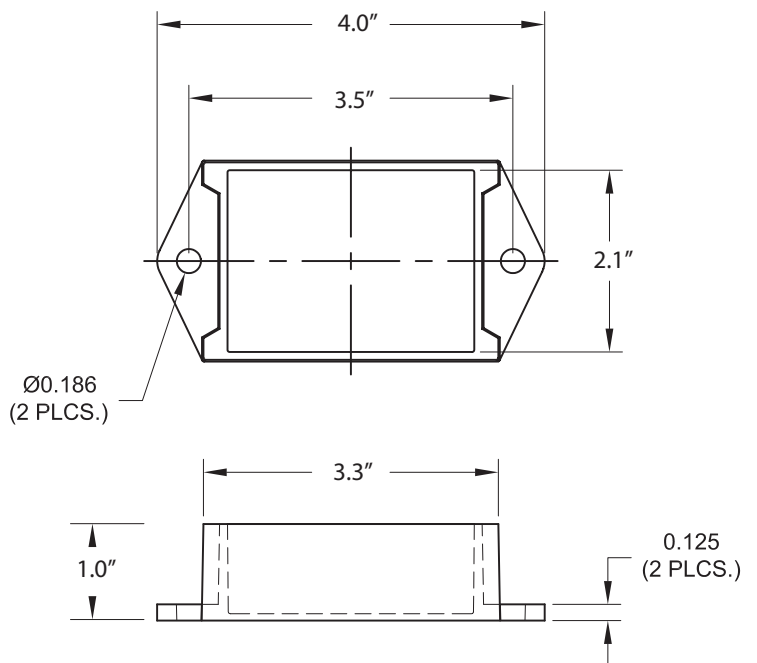
When TS+ and TS- input terminals are electrically connected by either a switch or thermostat, the fan controller ramps fan on momentarily in reverse to clear debris from cooler. Fan is then allowed to spin down, and ramped back on in forward direction. When the TS inputs are disconnected or opened, fan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

Consult factory for special requirements, or other programming options.

ORDERING INFORMATION

PART #	DESCRIPTION
FRC20	Fan Reversing Controller

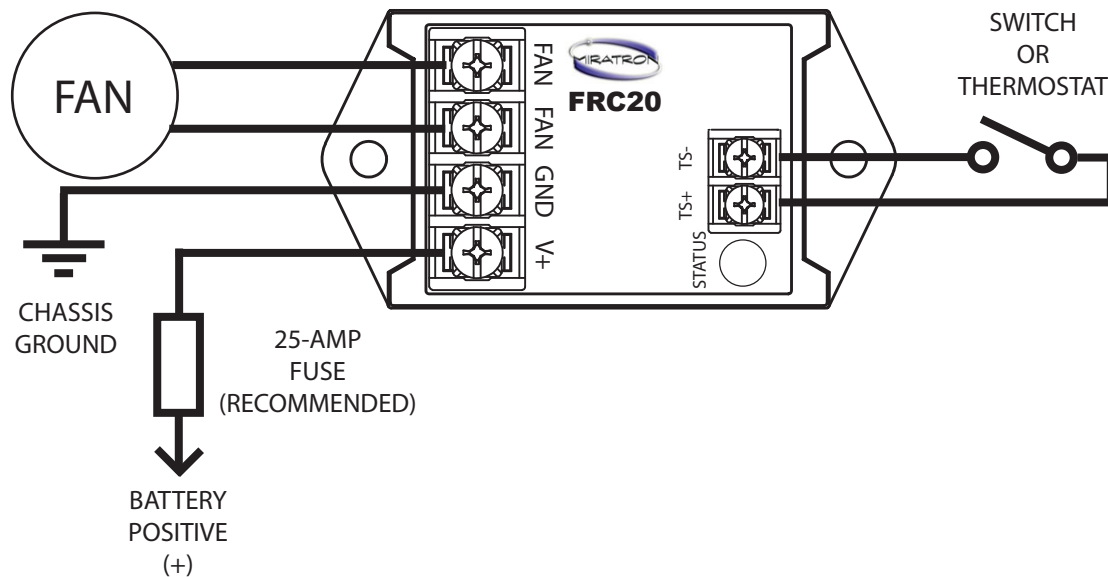
DIMENSIONS



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	-40°C to 85°C
	Operating ambient temperature	-40°C to 50°C

WIRING



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



Temperature adjustment shown without protective cover.

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

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

PART #	DESCRIPTION
FRC100	Deluxe Fan Reversing Controller with temperature sender included
TS10	Temperature sender probe only
FCB	Fan Controller mounting bracket only

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.

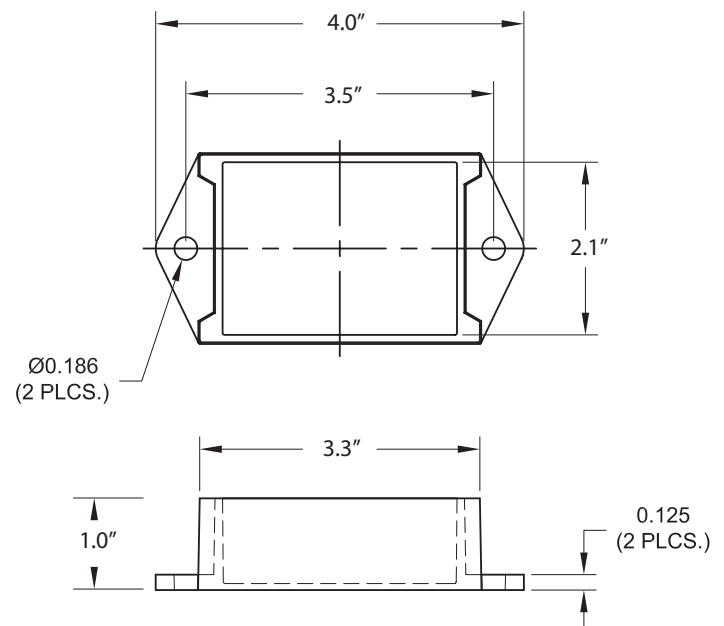
Fault Detection

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.

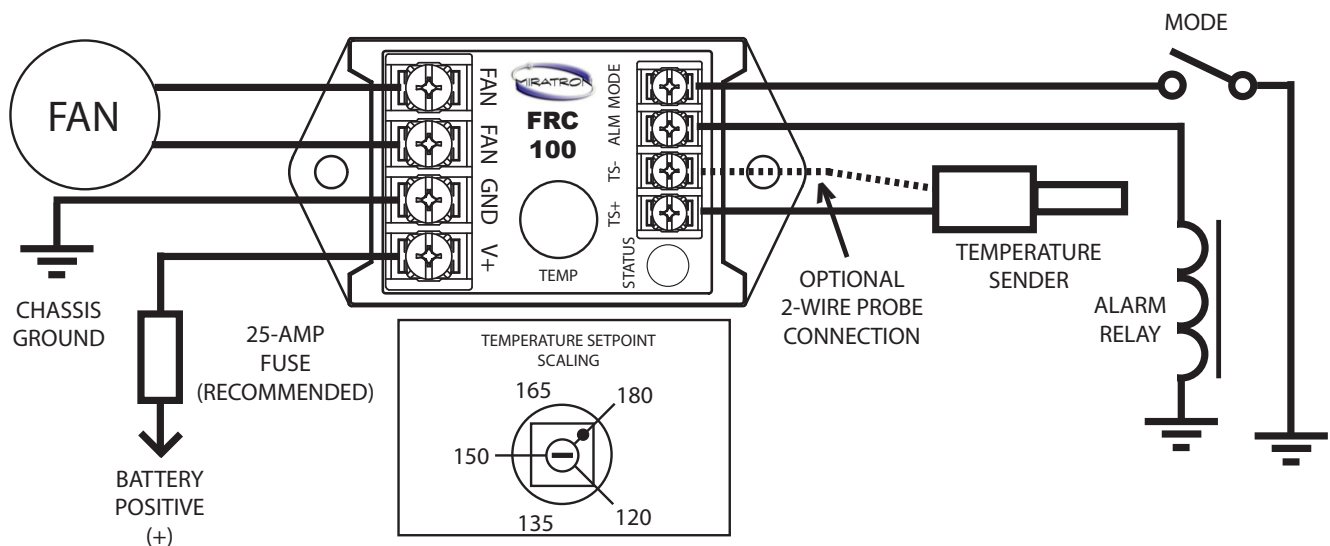
DIMENSIONS



SPECIFICATIONS

General	Power Requirement	12-24vdc, 100mA nominal + power to FAN
	Fan	Solid-State proportional output. 25-Amps Max.
Outputs	Output de-energized on overcurrent (>30 amps) fan condition. Reset power to retry.	
	Reverse time	10 seconds
	Ramp on time	5 seconds
	Alarm	Solid-State open collector, positive output. 0.5-Amp Max.
Operation	Alarm output energized on fault or above high temperature limit.	
	Operation	Temperature above setpoint = ramp to 100% output
	Setpoint adjustment range = 120 to 180degF	
	High Temperature Limit	185degF Alarm output energized.
Control Range	Temperature	For use with Datcon 02024-00 (Miratron TS10)
	Mode	Connect to 12 or 24Vdc (battery) and ground TS+ to energize fan.
Inputs	Mode	Connect to 12 or 24Vdc (battery) and ground TS+ to energize fan.
	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
Indicators		4 blink = Over temp alarm
	Overall	4.0" L x 2.1" W x 1" H
	Mounting	Hardware included. Optional mounting bracket available.
	Sealing	Potted electronic module
Dimensions	Storage	-40°C to 85°C
	Operating ambient temperature (FRC100 controller temperature only)	-10°C to 50°C

WIRING



TERMINAL BLOCK LABELS:

TS +	TEMP SENDER (+) OR THERMOSTAT	V+	12/24V BATTERY POS (+)
TS -	TEMP SENDER (-) OR THERMOSTAT	GND	CHASSIS GROUND / BATTERY NEG (-)
ALM	ALARM OUTPUT, 0.5 AMP MAX.	FAN +	FAN OUTPUT, 25 AMPS MAX.
MODE	MODE SELECT	FAN -	FAN OUTPUT, 25 AMP MAX.



Valve Driver Product Selector

Interface control devices to valve actuators

MODELS

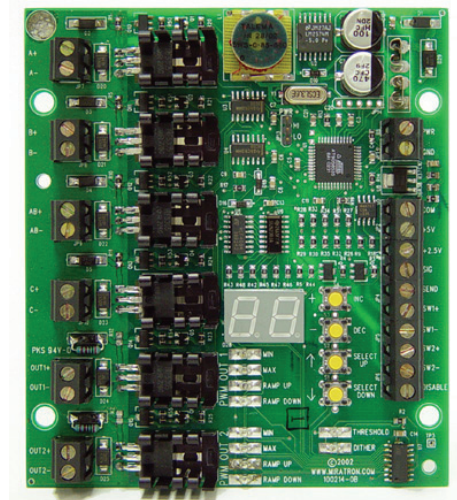
		Analog Inputs Joystick or Pot	Voltage Input	Digital Outputs	Adjustable Ramping	Proportional Outputs	Proportional Output Type
PC1200	Factory configurable I/O module with field adjustable parameters	Up to 5	Up to 5	Up to 10	YES	Up to 10	PWM and/or ratiometric
PC10	Compact potted module	1	-	-	YES	2	PWM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



PC1200



PC20



PC100/200



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

General	Power Requirement	12-30vdc, 100mA nominal + power to loads
	Fuses	10-amp mini blade fuse in wiring harness
Inputs	Analog	Up to 5, 0.5 to 4.5vdc, factory configured
	Universal	Up to 10 sourcing 5-amp outputs
		Proportional, Digital (bang/bang), ratiometric, or unamplified
	Field Wiring	6' pigtail with mating Deutsch DTM connector
Enclosure		Nylon 6/6 black, IP66
		Approximate size: 5.24" L x 4.63"W x 1.48"D
Environmental	Storage	-40°C to 85°C
	Operating	-10°C to 60°C

ORDERING INFORMATION

PART #	DESCRIPTION
PC1200-xxxx	Programmable I/O module

"xxxx" Factory assigned configuration number.



PC10 Panel Mounted Proportional Control

Panel mounted proportional valve driver



The PC10 makes fast and easy work out of designing and assembling valve control panels.

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.

SINGLE OUTPUT
SPEED CONTROL



DUAL OUTPUT
SPEED / DIRECTION CONTROL



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.

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

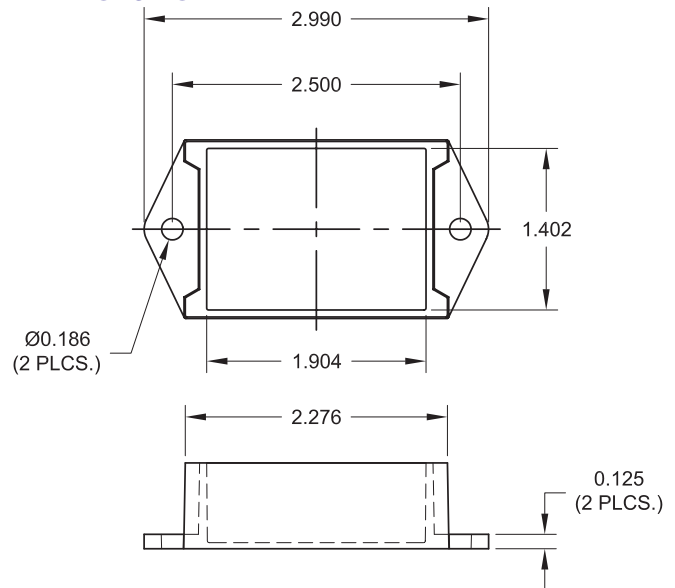
■ Compact Size

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.

DIMENSIONS



Knob and panel seal not shown.

ORDERING INFORMATION

PART #	DESCRIPTION
PC10	Proportional Controller, Single/Dual valve speed/direction control

SPECIFICATIONS

General
Outputs

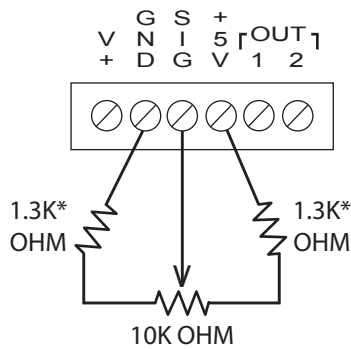
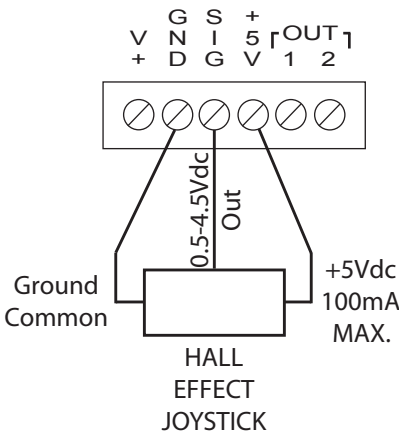
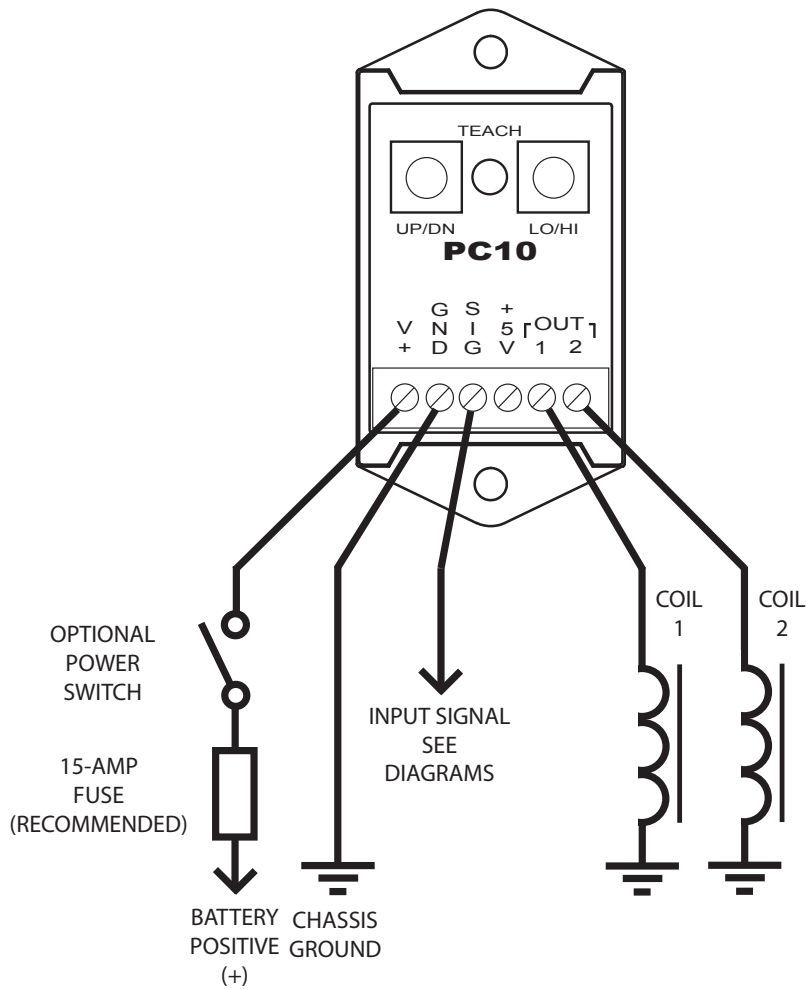
Power requirement	9-30vdc, 50mA nominal + power to loads and joystick
PWM Frequency	200Hz
Dither	Fixed
PWM current	0 to supply voltage, 5-amps max
+5V excitation	100mA MAX.
Adjustments	Min/Max: 0 to V+ Ramp up/down
Deadband	Built-in 10 degree deadband around neutral position

Input
Dimensions

Voltage	0.5 to 4.5Vdc (5Vdc excitation provided for resistive controls)
Overall	3.0" L x 1.6" W x 1" H (behind panel depth)
Mounting	2 x #8-32 X 1/2" machine screws
Storage	-40°C to 85°C
Operating	-10°C to 60°C

Environmental

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.

	OUT 1	OUT 2
SINGLE	Proportional output - Clockwise from neutral	Not used.
DUAL	Proportional output - Clockwise from neutral	Proportional output - Counterclockwise from neutral



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.

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.

SINGLE OUTPUT
SPEED CONTROL



DUAL OUTPUT
SPEED / DIRECTION CONTROL



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.

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

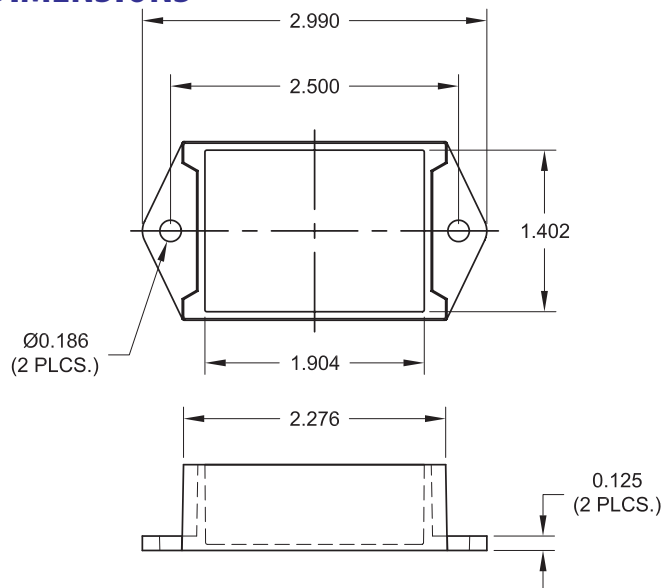
Compact Size

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.

DIMENSIONS



Knob and panel seal not shown.

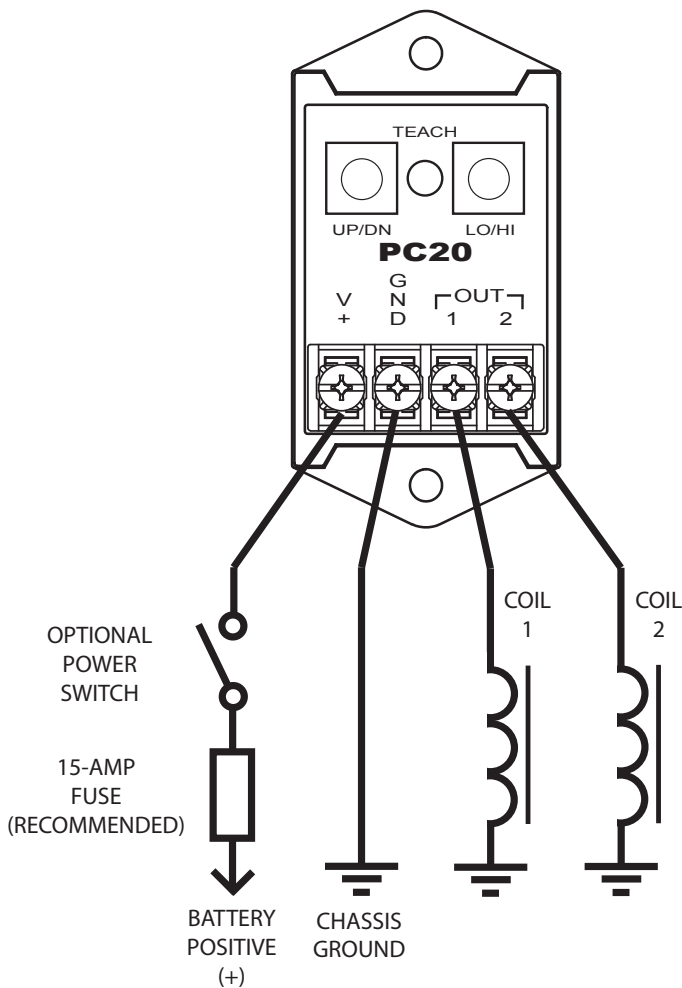
ORDERING INFORMATION

PART #	DESCRIPTION
PC20	Proportional Controller, Single/Dual valve speed/direction control

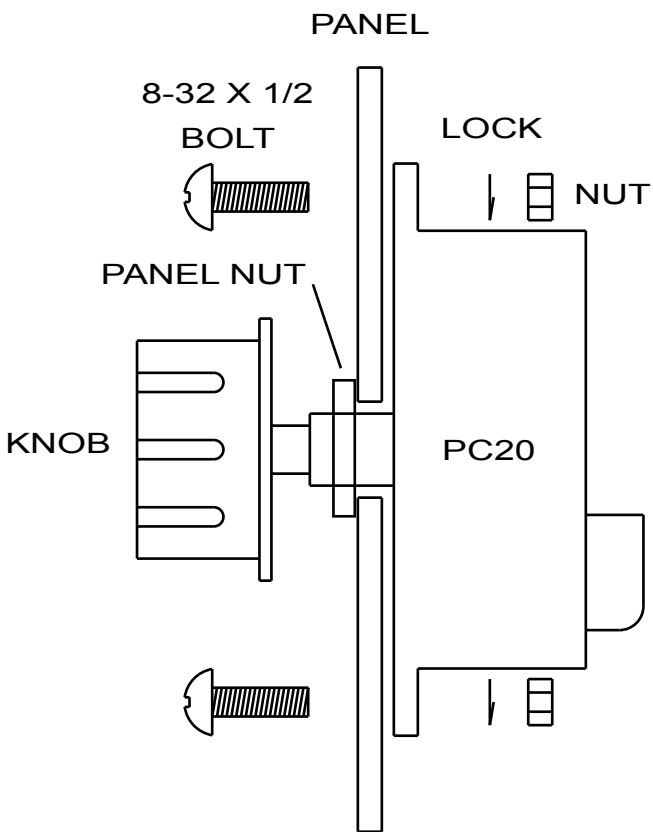
SPECIFICATIONS

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
Input	Deadband	Built-in 10 degree deadband around neutral position
Dimensions	Potentiometric	Controlled by built-in potentiometer
	Overall	3.0" L x 1.6" W x 1" H (behind panel depth)
Environmental	Mounting	2 x #8-32 X 1/2" machine screws
	Storage	-40°C to 85°C
	Operating	-10°C to 60°C

WIRING



INSTALLATION

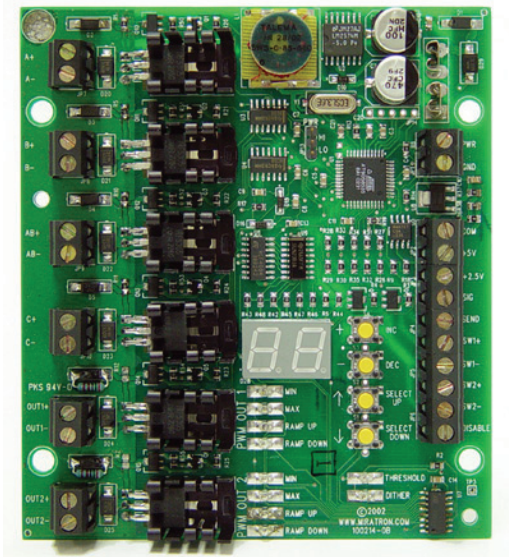


	OUT 1	OUT 2
SINGLE	Proportional output - Clockwise from neutral	Not used.
DUAL	Proportional output - Clockwise from neutral	Proportional output - Counterclockwise from neutral



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.

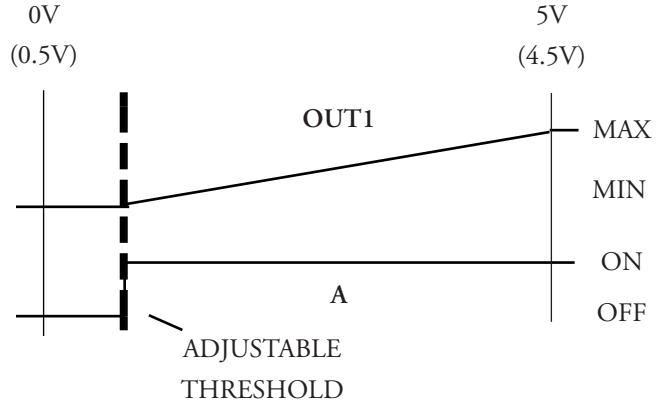
Outputs

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

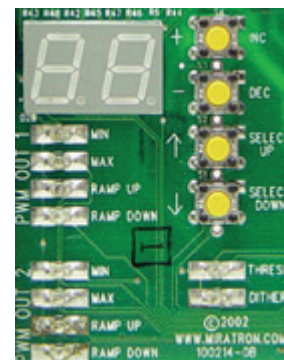
Inputs are provided for a toggle switch to manually override or "bump" the output signal without using a joystick or potentiometer.

OPERATION DIAGRAM



SETUP

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



ORDERING INFORMATION

PART #	DESCRIPTION
PC100	Single coil valve driver

SPECIFICATIONS

General

Power requirement 9-30vdc, 250mA nominal + power to loads

Digital Output

Fuse Blade fuse, 15-amp

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

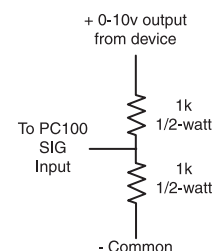
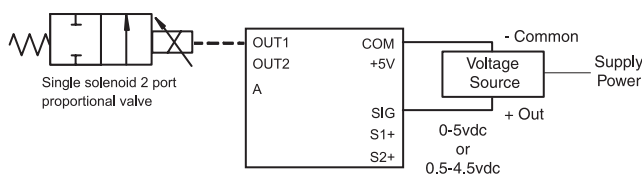
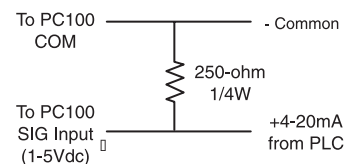
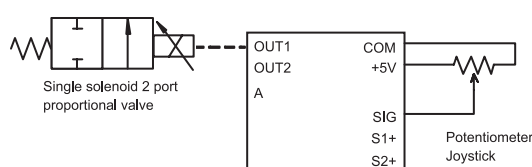
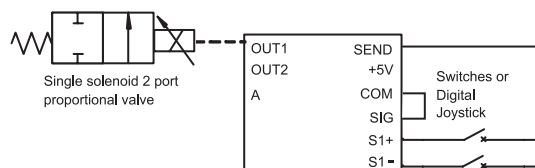
Mounting 4 x #6 self-tapping screws

Environmental

Storage -40°C to 85°C

Operating -10°C to 60°C

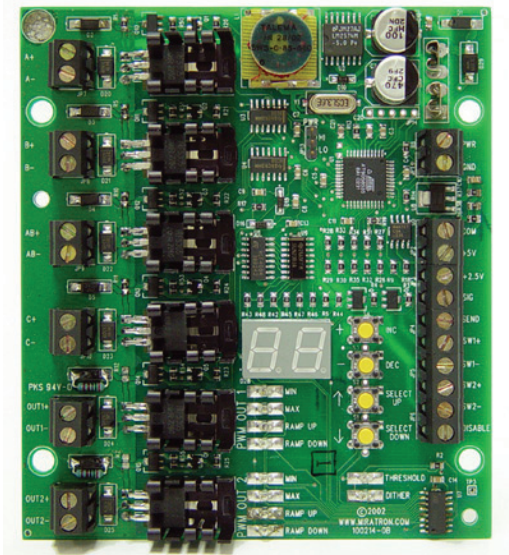
WIRING EXAMPLES:





PC200 Proportional Controller Card, Dual

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.

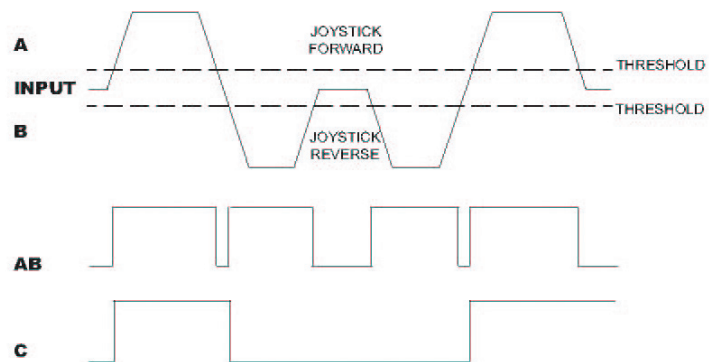
Outputs

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

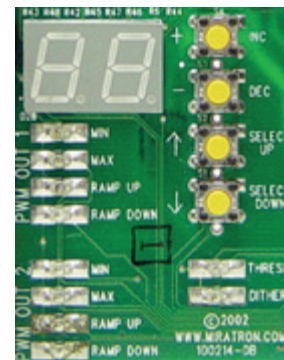
Inputs are provided for toggle switches to manually override or "bump" the output signals without using a joystick or potentiometer.

OPERATION DIAGRAM



SETUP

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



ORDERING INFORMATION

PART #	DESCRIPTION
PC200	Dual coil valve driver

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

+2.5vdc, 50mA max provided for tap reference

1k pot recommended

Digital Inputs

Manual Switches Dry contact - connect "SEND" to SW1+ or SW1- and SW2+ or SW2-

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

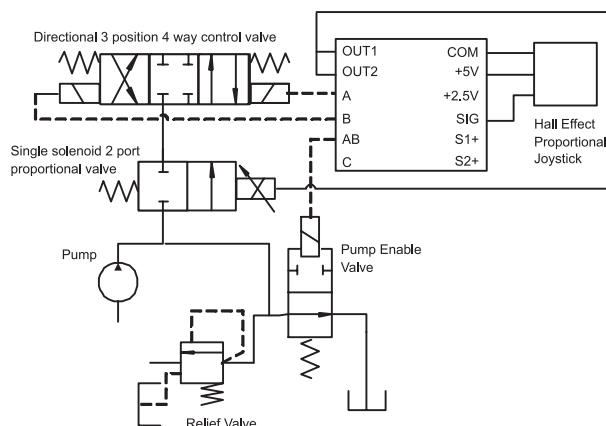
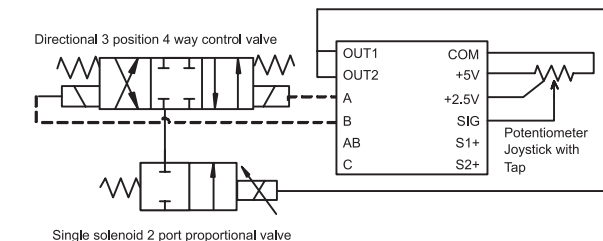
Environmental

Storage -40°C to 85°C

Operating -10°C to 60°C

* 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:



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.

WARNING
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.

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.

Security Interest: We maintain a security interest in our products. We reserve the right to repossess any equipment for which we have not been paid. This includes products that have already been shipped to an end customer, either individually, or as part of a machine or process.

New Customers: New customers placing an order may contact our credit department for fast friendly credit approval.

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

Backorders: If an item is not in stock, it will be placed on back order and shipped when the item is available via the same method as the original order. You may cancel a backorder at any time prior to shipping by contacting Customer Service at sales@miratron.com or call toll-free 1-866-417-5008.

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.

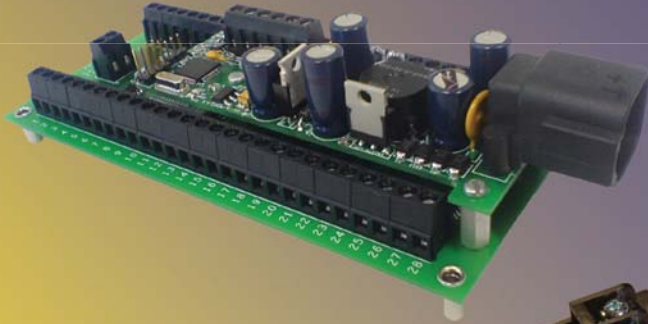
Changes to Orders: We try to accommodate order changes if possible, up to the point of shipment. After shipment, standard catalog product may be exchanged, returned for credit, or subject to restocking per Miratron policies. Custom product cannot be returned except under the terms of our Warranty.

Purchase Orders: We do not require confirming P.O.s for telephone orders, but if your company policy requires it, please make sure it is clearly labeled as a confirming purchase order. Please remember, only our terms and conditions will apply.

Product and Pricing Variances: Product improvement is a continual process at Miratron. Products specifications, features, and pricing are subject to change without notice.

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.

Governing Law: This agreement shall be governed by and interpreted in accordance with the laws of the State of Oregon applicable to contracts made and to be performed entirely within the State of Oregon. Any and all disputes arising out of or in connection with this agreement shall, at the option of Miratron, be resolved by binding arbitration in the State of Oregon. Venue of any arbitration or other legal action arising out of or in connection with this agreement shall be at the sole option of Miratron. The prevailing party in any such arbitration or other legal action shall be entitled to recover its attorney's fees and expenses, including expert witness fees, in addition to any other costs allowed by law. Notwithstanding and in addition to the foregoing, should Miratron retain any attorney or collection agency for the purpose of collecting monies owed by Purchaser to Miratron for products or services sold hereunder, Purchaser shall pay all of Miratron's costs of collection, including attorney's fees, whether or not a lawsuit is filed to collect the debt.



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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