



2020 Ex Remote Controls Product Catalogue

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Oracle RC Flameproof Radio Control Transceiver

Oracle RC Flameproof Radio Control Transceiver (915 MHz Band) Part Number: L0MT0801

The L0MT0801 Oracle RC is a self-contained, flameproof (Ex d) radio control data transceiver supporting radio remote control of mobile mining machinery. The module communicates with a variety of Pempek - manufactured handheld remote control consoles via a 2-way radio data stream (based on the 915 MHz band)

A single cable entry to the product supplies power and data communications. A range of field bus options are support - including RS-422, Ethernet and Ethernet / IP. A host PLC communicates with the Oracle via field bus to receive key-press commands from the remote handset, and send machine status and data logging information back to the handset

The PLC can also configure the operating channel.

Features & Benefits

- Self-contained, certified, flameproof (Ex d) housing
- No external antenna cable required
- Antenna is built into the housing of the product
- Flexible power supply options (PoE or 24VDC)
- Single gland entry for power and data cable
- Built in radio control data integrity protection
- Supports PLC safety functions such as handset model verification and handset serial number pairing
- Simple, easy way to add remote control to any flameproof application
- Easy maintenance
- Easy configuration

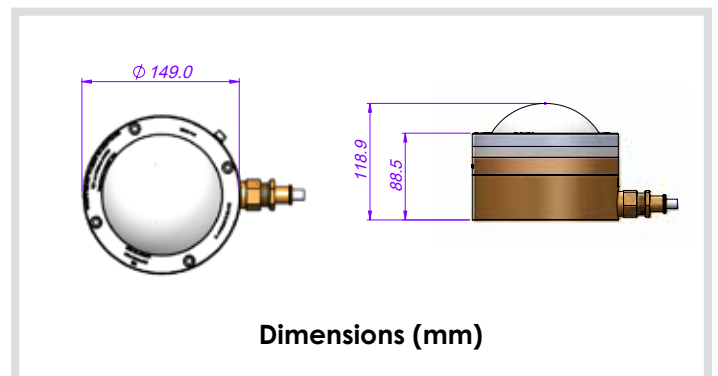


Specifications

- Radio Band: 902 to 928 MHz
- Radio Signal Strength: Less than 100 mW
- Power Supply: 24VDC
- Ambient Temperature: -10°C to +60°C
- Ingress Protection: IP 65
- Field Bus: RS-422 / Ethernet (Ethernet Available, Contact Sales Representative)
Default Firmware: P0TE0001 (RS-422 /Ethernet)

Typical Application

- Underground mining vehicles
- Continuous Miners
- Bolter Miners
- Road Headers
- Longwall Shearers
- Feeder Breakers
- Mobile Bolters
- Shuttle Cars



Oracle RC Flameproof Radio Control Transceiver

Oracle RC Flameproof Radio Control Transceiver (915 MHz Band) (5VDC) Part Number: L0MT0803

The L0MT0803 Oracle RC is a self-contained, flameproof (Ex d) radio control data transceiver supporting radio remote control of mobile mining machinery. The module communicates with a variety of Pempek-manufactured handheld remote control consoles via a 2-way radio data stream (based on the 915 MHz band)

A single cable entry to the product supplies power and data communications. A range of field bus options are support - including RS-422, Ethernet and Ethernet/IP. A host PLC communicates with the Oracle via field bus to receive keypress commands from the remote handset, and send machine status and data logging information back to the handset

The PLC can also configure the operating channel

The L0MT0803 model is only suitable for 5VDC supply

Features & Benefits

- Self-contained, certified, flameproof (Ex d) housing
- No external antenna cable required
- Antenna is built into the housing of the product
- Flexible power supply options (PoE or 24VDC)
- Single gland entry for power and data cable
- Built in radio control data integrity protection
- Supports PLC safety functions such as handset model verification and handset serial number pairing
- Simple, easy way to add remote control to any flameproof application
- Easy maintenance
- Easy configuration

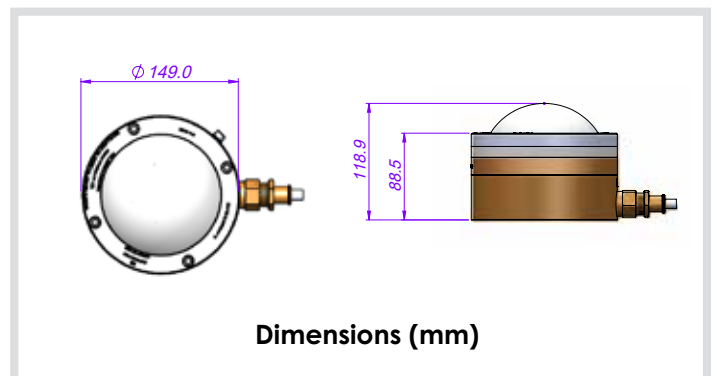


Specifications

- Radio Band: 902 to 928 MHz
- Radio Signal Strength: Less than 100 mW
- Power Supply: 5VDC
- Ambient Temperature: -10°C to +60°C
- Ingress Protection: IP 65
- Field Bus: RS-422 / Ethernet (Ethernet/IP Available, Contact Sales Representative)
- Default Firmware: POTE0001 (RS-422 / Ethernet)

Typical Application

- Underground mining vehicles
- Continuous Miners
- Bolter Miners
- Road Headers
- Longwall Shearers
- Feeder Breakers
- Mobile Bolters
- Shuttle Cars



Oracle RC Flameproof Radio Control Transceiver

Oracle RC Flameproof Radio Control Transceiver (915 MHz Band) (ATEX) Part Number: L0MT0804

The L0MT0801 Oracle RC is a self-contained, flameproof (Ex d) radio control data transceiver supporting radio remote control of mobile mining machinery. The module communicates with a variety of Pempek-manufactured handheld remote control consoles via a 2-way radio data stream (based on the 915 MHz band)

A single cable entry to the product supplies power and data communications. A range of field bus options are support - including RS-422, Ethernet and Ethernet/IP

A host PLC communicates with the Oracle via field bus to receive key-press commands from the remote handset, and send machine status and data logging information back to the handset

The PLC can also configure the operating channel

The L0MT0804 model is configured only applications requiring ATEX certification

Features & Benefits

- Self-contained, certified, flameproof (Ex d) housing
- No external antenna cable required
- Antenna is built into the housing of the product
- Flexible power supply options (PoE or 24VDC)
- Single gland entry for power and data cable
- Built in radio control data integrity protection
- Supports PLC safety functions such as handset model verification and handset serial number pairing
- Simple, easy way to add remote control to any flameproof application
- Easy maintenance
- Easy configuration

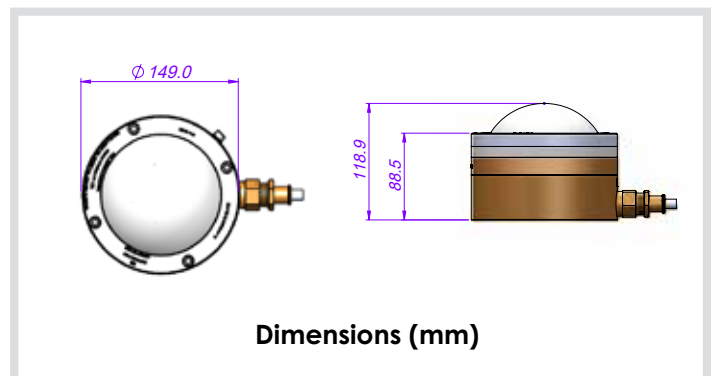


Specifications

- Radio Band: 902 to 928 MHz
- Radio Signal Strength: Less than 100 mW
- Power Supply: 24VDC
- Ambient Temperature: -10°C to +60°C
- Ingress Protection: IP 65
- Field Bus: RS-422 / Ethernet (Ethernet/IP Available, Contact Sales Representative)
- Default Firmware: P0TE0001 (RS-422 / Ethernet)

Typical Application

- Underground mining vehicles
- Continuous Miners
- Bolter Miners
- Road Headers
- Longwall Shearers
- Feeder Breakers
- Mobile Bolters
- Shuttle Cars



Oracle RC Flameproof Radio Control Transceiver

Oracle RC Flameproof Radio Control Transceiver (868 MHz Band) Part Number: L0MT1001

The L0MT1001 Oracle RC is a self-contained, flameproof (Ex d) radio control data transceiver supporting radio remote control of mobile mining machinery. The module communicates with a variety of Pempek-manufactured handheld remote control consoles via a 2-way radio data stream (based on the 868 MHz band)

A single cable entry to the product supplies power and data communications. A range of field bus options are support - including RS-422, Ethernet and Ethernet/IP

A host PLC communicates with the Oracle via field bus to receive key-press commands from the remote handset, and send machine status and data logging information back to the handset

The PLC can also configure the operating channel

Features & Benefits

- Self-contained, certified, flameproof (Ex d) housing
- No external antenna cable required
- Antenna is built into the housing of the product
- Flexible power supply options (PoE or 24VDC)
- Single gland entry for power and data cable
- Built in radio control data integrity protection
- Supports PLC safety functions such as handset model verification and handset serial number pairing
- Simple, easy way to add remote control to any flameproof application
- Easy maintenance
- Easy configuration

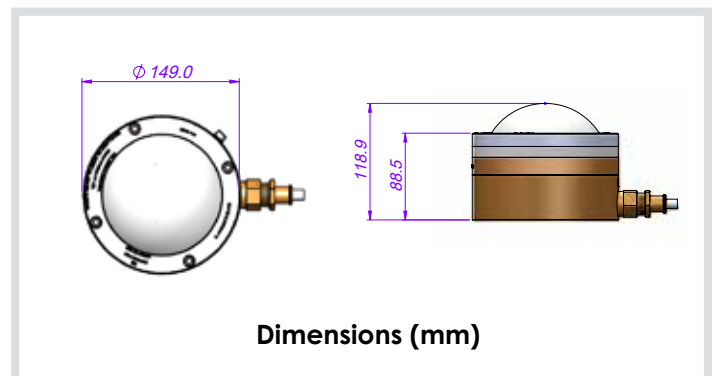


Specifications

- Radio Band: 868.125 to 869.925 MHz
- Radio Signal Strength: Less than 100 mW
- Power Supply: 24VDC
- Ambient Temperature: -10°C to +60°C
- Ingress Protection: IP 65
- Field Bus: RS-422 / Ethernet (Ethernet/IP Available, Contact Sales Representative)
- Default Firmware: POTE0001 (RS-422 / Ethernet)

Typical Application

- Underground mining vehicles
- Continuous Miners
- Bolter Miners
- Road Headers
- Longwall Shearers
- Feeder Breakers
- Mobile Bolters
- Shuttle Cars



Oracle RC Flameproof Radio Control Transceiver

Oracle RC Flameproof Radio Control Transceiver (MSHA) (915 MHz Band) Part Number: L0MT1201

The L0MT1201 Oracle RC is a self-contained, flameproof (Ex d) radio control data transceiver supporting radio remote control of mobile mining machinery. The module communicates with a variety of Pempek-manufactured handheld remote control consoles via a 2-way radio data stream (based on the 915 MHz band)

A single cable entry to the product supplies power and data communications. A range of field bus options are support - including RS-422, Ethernet and Ethernet/IP

A host PLC communicates with the Oracle via field bus to receive key-press commands from the remote handset, and send machine status and data logging information back to the handset

The PLC can also configure the operating channel

The L0MT1201 model is intended for MSHA-approved (USA) applications only

This L0MT1201 model supports data/power cable with O.D. range of 6.6 to 9.5mm (Gland P/N: H0MT2801)

A special MSHA-approved cable gland configuration is required - contact your sales representative for details

Features & Benefits

- Self-contained, certified, flameproof (Ex d) housing
- No external antenna cable required
- Antenna is built into the housing of the product
- Flexible power supply options (PoE or 24VDC)
- Single gland entry for power and data cable
- Built in radio control data integrity protection
- Supports PLC safety functions such as handset model verification and handset serial number pairing
- Simple, easy way to add remote control to any flameproof application
- Easy maintenance
- Easy configuration

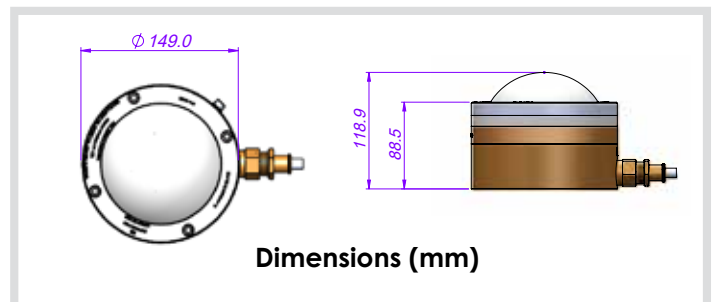


Specifications

- Radio Band: 902 to 928 MHz
- Radio Signal Strength: Less than 100 mW
- Power Supply: 24VDC
- Ambient Temperature: -10°C to +60°C
- Ingress Protection: IP 65
- Default Cable Gland: 6.6 to 9.5mm O.D. Available, Contact Sales Representative
- Field Bus: RS-422 / Ethernet (Ethernet/IP Available, Contact Sales Representative)
- Default Firmware: POTE0001 (RS-422 / Ethernet)

Typical Application

- Underground mining vehicles
- Continuous Miners
- Bolter Miners
- Road Headers
- Longwall Shearers
- Feeder Breakers
- Mobile Bolters
- Shuttle Cars



Accessories

Part Number	Description
H0MT2801	Gland

Oracle RC Flameproof Radio Control Transceiver

Oracle RC Flameproof Radio Control Transceiver (866 MHz Band) Part Number: L0MT1301

The L0MT1301 Oracle RC is a self-contained, flameproof (Ex d) radio control data transceiver supporting radio remote control of mobile mining machinery

The module communicates with a variety of Pempek-manufactured handheld remote control consoles via a 2-way radio data stream (based on the 866 MHz band)

A single cable entry to the product supplies power and data communications. A range of field bus options are support - including RS-422, Ethernet and Ethernet / IP

A host PLC communicates with the Oracle via field bus to receive key-press commands from the remote handset, and send machine status and data logging information back to the handset

The PLC can also configure the operating channel

Features & Benefits

- Self-contained, certified, flameproof (Ex d) housing
- No external antenna cable required
- Antenna is built into the housing of the product
- Flexible power supply options (PoE or 24VDC)
- Single gland entry for power and data cable
- Built in radio control data integrity protection
- Supports PLC safety functions such as handset model verification and handset serial number pairing
- Simple, easy way to add remote control to any flameproof application
- Easy maintenance
- Easy configuration

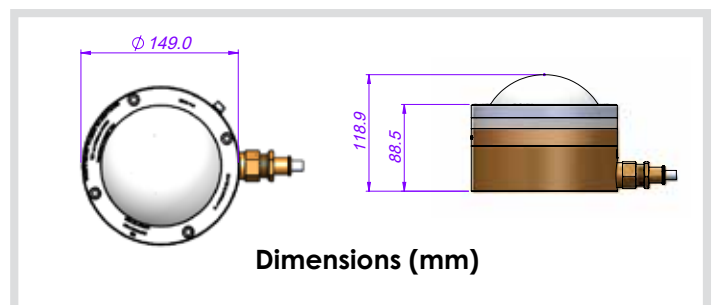


Specifications

- Radio Band: 865.025 to 866.975 MHz
- Radio Signal Strength: Less than 100 mW
- Power Supply: 24VDC
- Ambient Temperature: -10°C to +60°C
- Ingress Protection: IP 65
- Field Bus: RS-422 / Ethernet (Ethernet/IP Available, Contact Sales Representative)
- Default Firmware: POTE0001 (RS-422 / Ethernet)

Typical Application

- Underground mining vehicles
- Continuous Miners
- Bolter Miners
- Road Headers
- Longwall Shearers
- Feeder Breakers
- Mobile Bolters
- Shuttle Cars



Oracle RC Flameproof Radio Control Transceiver

Oracle RC Flameproof Radio Control Transceiver (Narrow 866 MHz Band) Part Number: L0MT1401

The L0MT1401 Oracle RC is a self-contained, flameproof (Ex d) radio control data transceiver supporting radio remote control of mobile mining machinery

The module communicates with a variety of Pempek-manufactured handheld remote control consoles via a 2-way radio data stream (based on the Narrow-version 866 MHz band)

A single cable entry to the product supplies power and data communications

A range of field bus options are support - including RS-422, Ethernet and Ethernet/IP. A host PLC communicates with the Oracle via field bus to receive key-press commands from the remote handset, and send machine status and data logging information back to the handset

The PLC can also configure the operating channel

The L0MT1401 radio frequency configuration makes it suitable for use in Russia

Note that certification for use in Russia is pending

Contact your sales representative for more details

Features & Benefits

- Self-contained, certified, flameproof (Ex d) housing
- No external antenna cable required
- Antenna is built into the housing of the product
- Flexible power supply options (PoE or 24VDC)
- Single gland entry for power and data cable
- Built in radio control data integrity protection
- Supports PLC safety functions such as handset model verification and handset serial number pairing
- Simple, easy way to add remote control to any flameproof application
- Easy maintenance
- Easy configuration

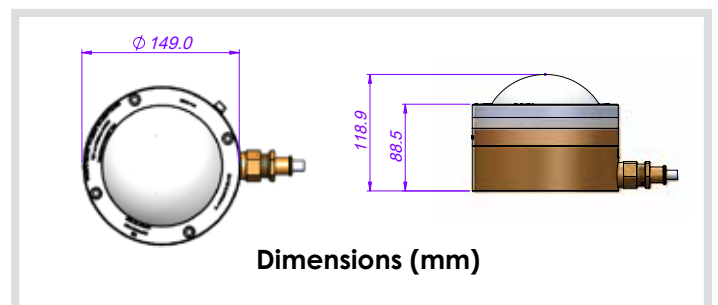


Specifications

- Radio Band: 868.7 to 869.2 MHz
- Radio Signal Strength: Less than 100 mW
- Power Supply: 24VDC
- Ambient Temperature: -10°C to +60°C
- Ingress Protection: IP 65
- Field Bus: RS-422 / Ethernet (Ethernet/IP Available, Contact Sales Representative)
- Default Firmware: POTE0001 (RS-422 / Ethernet)

Typical Application

- Underground mining vehicles
- Continuous Miners
- Bolter Miners
- Road Headers
- Longwall Shearers
- Feeder Breakers
- Mobile Bolters
- Shuttle Cars



Oracle RC Flameproof Radio Control Transceiver Spare Parts

IEC Oracle Transceiver 915MHz Ex d CANopen Part Number: L0MT1101

The L0MT1401 Oracle RC is a self-contained, flameproof (Ex d) radio control data transceiver supporting radio remote control of mobile mining machinery

The module communicates with a variety of Pempek manufactured handheld remote control consoles via a 2-way radio data stream (based on the Narrow-version 866 MHz band)

A single cable entry to the product supplies power and data communications. A range of field bus options are support - including RS-422, Ethernet and Ethernet/IP. A host PLC communicates with the Oracle via field bus to receive key-press commands from the remote handset, and send machine status and data logging information back to the handset

The PLC can also configure the operating channel

The L0MT1401 radio frequency configuration makes it suitable for use in Russia

Note that certification for use in Russia is pending

Contact your sales representative for more details

Features & Benefits

- Self-contained, certified, flameproof (Ex d) housing
- No external antenna cable required
- Antenna is built into the housing of the product
- Flexible power supply options (PoE or 24VDC)
- Single gland entry for power and data cable
- Built in radio control data integrity protection
- Supports PLC safety functions such as handset model verification and handset serial number pairing
- Simple, easy way to add remote control to any flameproof application
- Easy maintenance
- Easy configuration

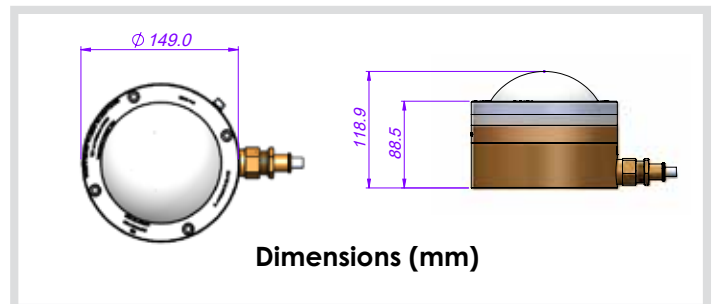


Specifications

- Radio Band: 868.7 to 869.2 MHz
- Radio Signal Strength: Less than 100 mW
- Power Supply: 24VDC
- Ambient Temperature: -10°C to +60°C
- Ingress Protection: IP 65
- Field Bus: RS-422 / Ethernet (Ethernet/IP Available, Contact Sales Representative)
- Default Firmware: POTE0001 (RS-422 / Ethernet)

Typical Application

- Underground mining vehicles
- Continuous Miners
- Bolter Miners
- Road Headers
- Longwall Shearers
- Feeder Breakers
- Mobile Bolters
- Shuttle Cars



Remote Console Toggle Switch Hand-Held Handset

**Remote Console Toggle Switch Hand-Held Handset
(915 MHz Band) Generic Bolter Miners
Part Number: L0XN0201**

**Remote Console Toggle Switch Hand-Held Handset
(915 MHz Band) for Mobile Roof Supports
Part Number: L0XN0501**

**Remote Console Toggle Switch Hand-Held Handset
(915 MHz Band) for Generic Place Change Miner
Part Number: L0XN0601**

**Remote Console TITO 915 MHz Multi-bolter
Part Number: L0XN0401**

**Remote Console UHF ABLs/MRS Generic Exia
Part Number: L0KN3501**



The L0XN0201 Lunch Box is an intrinsically safe (Ex ia) radio control handset featuring toggle switches for control of a mobile mining machine

The internal re-chargeable battery provides up to 16 hours of continuous use between re-charge cycles

An internal motion sensor provides customisable safety shutdown options - such as console drop, console tilt or sudden impact shock

Pempek's two-way radio control technology also offers options for collecting and storing machine data while the machine is being controlled

The data is collected at the end of each shift by the charging station. Data is then available for machine reporting and performance analytics

The L0XN0201 model has been customized specifically for general purpose bolter miners

The L0XN0501 model has been customized specifically for controlling mobile roof supports

The remote console can be used to quickly switch control between up to four (4) separate roof support machines

The L0XN0601 model has been customized specifically for general purpose place-change continuous miners

Specifications

- Radio Band: 902 to 928 MHz
- Radio Signal Strength: Less than 100 mW
- Power Source: Internal Battery (rechargeable)
- Switch Type: 3-position Momentary Toggle (1-OFF-2)
- Switch Safety - Dual Contacts (DPDT)
- Number of Switches: 12
- Switch Layout: 11 x North-South / 1 x East - West
- Motion Sensor: Drop / Tilt / Impact Detection
- Ambient Temperature: -10°C to +50°C
- Ingress Protection: IP 66 / IP 67

Typical Application

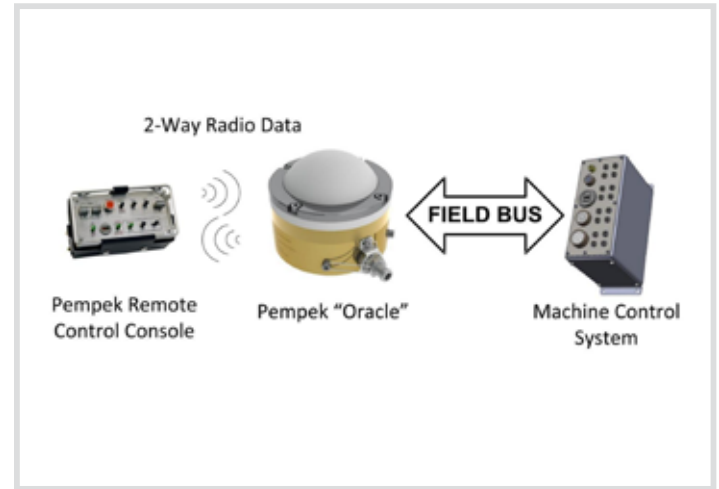
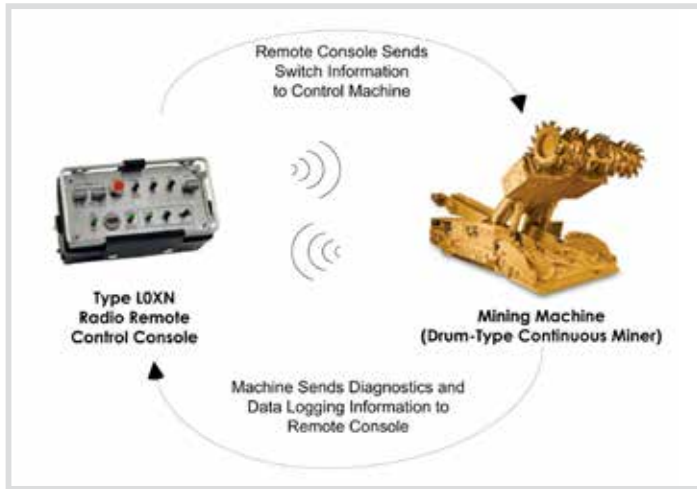
- Roof Support
- Continuous Miners
- Bolter Miners
- Change Miner

Standards Compliance

- AS/IEC 60079 (Exi)
- AS 4240.1:2009
- AS/IEC 61508 SIL 2

Example Application

System Integration Options



Integration of radio remote control in a machine control system application requires installation of a Pempek "Oracle" radio data transceiver. The Oracle manages 2-way radio data communications with the remote console. The machine control system can then communicate with the Oracle using any one of a range of industry-standard fieldbus options. Fieldbus options include RS-422 (Pempek K27 Protocol), canOPEN, Ethernet Powerlink, Ethernet/IP (CIP) or openSAFETY (Ethernet Powerlink).

Specifications

General

Parameter	Value
Type	Intrinsically-safe, battery-powered, radio remote control handset
Keypad	Momentary Toggle Switch (ON-OFF-ON) – 2 Functions per switch Option: Replace one Toggle Switch with latching, push-button STOP
Control Switches	12 Toggle Switches (Option: 11 Toggles and 1 latching push-button STOP)
Display	4 character LED dot display

Radio Data Link

Parameter	Value
Protocol	Pempek K27
Type	Connection-oriented, half-duplex radio data link
Frequency Band	800 MHz Band or 900 MHz Band (depending on model configuration)
Operating Range	100 metres (typical)

Battery

Parameter	Value
Type	Internal, lithium-ion pack
Capacity	5.4 Ampere-hours
Charge Endurance	24 Hours (continuous operation)
Lifespan	600 charge/discharge cycles (approximately 2 years normal operation profile)

Radio Data Link

Parameter	Value
Operating Temperature	-10°C to +50°C
Environmental Protection	IP66/67
Mass	3.5 kilograms

Remote Console Push Button Hand-Held Handset

**Remote Console Push Button Hand-Held Handset
(915 MHz) for Road Headers**
Part Number: L0K60301

**Remote Console Push Button Hand-Held Handset
(915 MHz) for Continuous Miners**
Part Number: L0K60701

**Remote Console Push Button Hand-Held Handset
(915 MHz) for Bolter Miners**
Part Number: L0K61001

**Remote Console Push Button Hand-Held Handset
(EOL) Console Miner**
Part Number: L0K61301

The L0K60301 is an intrinsically safe (Ex ia) radio control handset providing membrane-style push buttons for radio remote control of mobile mining equipment

The pancake form factor makes the unit comfortable to hold in both hands, allowing easy access to control buttons from the operator's left and right thumbs

Two enable buttons - accessible from the left and right index fingers - support two-handed control of safety-critical functions

A built-in 2.4-inch color graphics display reports real-time status feedback from the machine while it is being controlled

The internal re-chargeable battery provides up to 16 hours of continuous use between re-charge cycles

An internal motion sensor provides customisable safety shutdown options - such as console drop, console tilt or sudden impact shock

Pempek's two-way radio control technology also offers options for collecting and storing machine data while the machine is being controlled

The data is collected at the end of each shift by the charging station

Data is then available for machine reporting and performance analytics

Typical Application

- Continuous Bolter/Miners
- Continuous Haulage
- Mobile Bolters
- Mobile Roof Supports
- Remote Control Scoops
- Remote Control Loaders
- Any intrinsically safe industrial remote control application



Features & Benefits

Industrial Intrinsically Safe Remote Console

- Exia / ATEX / MSHA Approved
- 12 Dual Function Mil-STD Toggle Switches
- Up to 40 Multi-Purpose Functions
- Integral LED Matrix Display
- Integral Rechargeable Battery

Embedded Industrial Micro-controller

- Low Power PIC Controller
- Integral Flash / RAM
- Advanced Monitoring Software

Narrow Band VHF/UHF

- 8/16 Channels @ 25KHz Spacing
- CCITT CRC Data Protection
- FSK Frequency Modulated
- VHF & UHF Bands
- Up to 100m line-of-sight range.

Operates Minus 10°C to +55°C

- All industrial components

Heavy Duty Enclosure

- Fully Self Contained IP67 Rating
- Stainless Steel Engraved Fascia
- Stainless Steel Switch Guard
- Internal Antenna
- Leather Bound Protective Case
- Rugged Construction

System Integration Options

The L0K6 Remote Console belongs to a family of Smart Remote Console products, providing real time control and feedback, as well as data logging capabilities.



Specifications

Supply		Communications	
Voltage	Internal Battery	Baud	1200bps
Battery Type	NiCd 5-Cell 1.2V Matched	Format	8N1
Battery Current	2.3 AH	CRC	CCITT 16-bit
Battery Current	Actively Limited to 275mA, Fuse / Diode Protected.*	Frame	Packet Oriented, Bit Masks
Wattage ^{MIN}	690mW	Throughput	10Hz
Wattage ^{MAX}	750mW		

Radio Module	
Supply	6.0VDC @ 90mA
Frequency	VHF (151MHz / 174MHz) UHF (458MHz / 472MHz) PLL Synthesised
Deviation	±2.6KHz
Power	17dBm (±2dBm)
Channels	32 (25KHz Spacing)
Modulation	Frequency Shift Keyed FM (Narrow Band)
Range MIN	100 meters "Line of Sight"
Range MAX	500 meters "Line of Sight"
Data Integrity	CCITT CRC (16 Bit)
Bandwidth	25KHz @ 1200bps
Antenna	Internal Passive Patch Antenna
Classification	Transmitter

Environmental	
Operating Temperature	Minus 10°C to +55°C
IP Rating	IP67
Humidity	T.B.A.
MTBF	5000 hours‡

Certification	
Australia	AUS Ex 01.3733X
Europe	BVS 04 ATEX E 088
USA	2G-4317

Remote Console Push Button One-Hand Handset

Radio Console Push Button One-Hand Handset (915 MHz Band) Longwall Shearer Part Number: L0WR0201

The L0WR0201 Longwall Shearer handset is an intrinsically safe (Ex ia) radio control handset providing membrane-style push buttons for radio remote control of mobile mining equipment

Using the side strap - the unit can be comfortably held in one hand; providing access to control buttons from a single thumb. The internal re-chargeable battery provides up to 16 hours of continuous use between re-charge cycles

An internal motion sensor provides customisable safety shutdown options - such as console drop, console tilt or sudden impact shock

Pempek's two-way radio control technology also offers options for collecting and storing machine data while the machine is being controlled

The data is collected at the end of each shift by the charging station. Data is then available for machine reporting and performance analytics

The L0WR0201 model has been customized specifically for controlling longwall shearers

The L0WR0201 features control labels in English

The L0WR0201 model operates in 915 MHz band

Typical Application

- Longwall Shearer



Features & Benefits

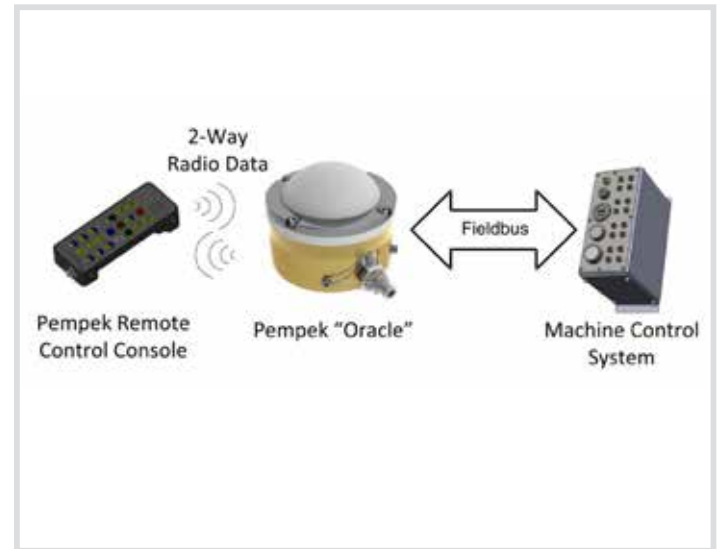
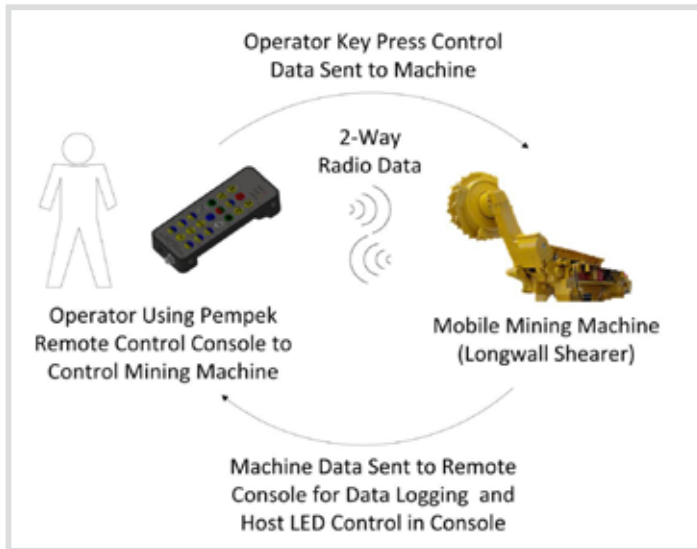
- Radio Remote Control Console is an intrinsically-safe, hand-held radio remote control handset; designed for remote control and monitoring of mobile mining equipment.
- The console features a bi-directional radio data link supporting 2-way communication with the control system fitted to the mining machine. The communication link allows operator key press commands to be sent to the machine for control. The communication link also provides a pathway for machine data to be sent back to the remote console in real time.
- The remote console features three (3) multi-colored LEDs to indicate status and diagnostic information to the operator.
- A built-in data logging facility allows machine data and console diagnostics to be recorded during the operating shift. This logged data can later be extracted at the surface and used to develop reports on mining production and machine maintenance records.
- There are several variants of the L0WR console, each of which has been developed to match a specific type or model of mining machine. Each L0WR model is fitted with a printed keypad membrane that matches the control functions of the machine that it was designed for.

Charging

- The L0WR Muesli Bar Remote Console may be charged using an L0SS Remote Console Charging station.

Example Application

System Integration Options



The remote console establishes and maintains a 2-way radio data link with the control system on-board the mobile mining machine. By way of this link, any keypress commands made by the operator are sent to the machine for control purposes.

The link also allows the machine to send data back to the remote console. The remote console features an internal "Flash" memory for storing the received machine data. This allows a data logging history to be compiled of the machine performance. Mine management can later retrieve the data logging information from the remote console and use it to generate mining machine performance and reliability reports.

Finally, the machine control system can control – by way of the feedback data pathway – one of the diagnostics lights (HOST LED) on the front panel of the console. This allows the machine to alert the operator to different status conditions.

The LOWR0201 Remote Console can be adapted to a wide range of machine control applications. For each new application it is necessary for Pempek to configure a control button assignment to suit the machine to be controlled. This consists of custom membrane keypad printing and allocation of a unique part number (model number) for the configuration.

In order for a machine control system to communicate with the remote console, a Pempek "Oracle" Radio Data Transceiver Base Station is required. The Oracle features a self-contained radio data transceiver that maintains constant communication with the remote console. The Oracle can then be controlled and monitored by the machine control system over an industry-standard fieldbus. Oracle models are available to support the following fieldbuses: RS-422, CANopen, Ethernet/IP, Ethernet Powerlink and OpenSAFETY (Ethernet Powerlink)

Remote Console Soft Toggle Hand-Held Handset

Radio Console Push Button Soft Toggle Hand-Held Handset (915 MHz Band) Continuous Miner
Part Number: **L0X20801**

Radio Console Push Button Soft Toggle Hand-Held Handset (915 MHz Band) Mobile Bolter
Part Number: **L0X20901**

Remote Control Proportional - Addcar Highwall Ethernet Tether
Part Number: **L0X20601**

The L0X20801 Stove Top is an intrinsically safe (Ex ia) radio control handset that provides soft toggle switches for controlling a mobile mining machine

A built-in 2.4-inch color graphics display reports real-time status feedback from the machine while it is being controlled

The internal re-chargeable battery provides up to 16 hours of continuous use between re-charge cycles

An internal motion sensor provides customisable safety shutdown options - such as console drop, console tilt or sudden impact shock

Pempek's two-way radio control technology also offers options for collecting and storing machine data while the machine is being controlled

The data is collected at the end of each shift by the charging station. Data is then available for machine reporting and performance analytics

The L0X20801 model has been customized specifically for controlling continuous miners

The L0X20801 model operates in 915 MHz band

Typical Application

- Road Headers
- Continuous Miners
- Bolter Miners
- Scoops
- LHDs

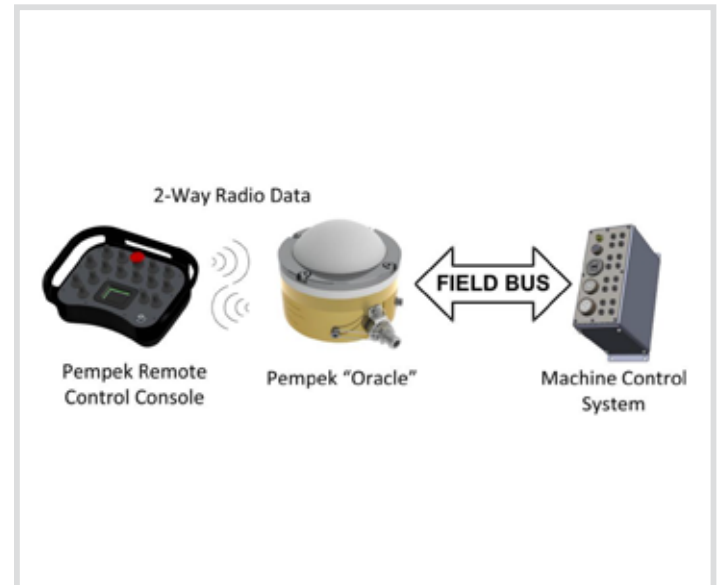
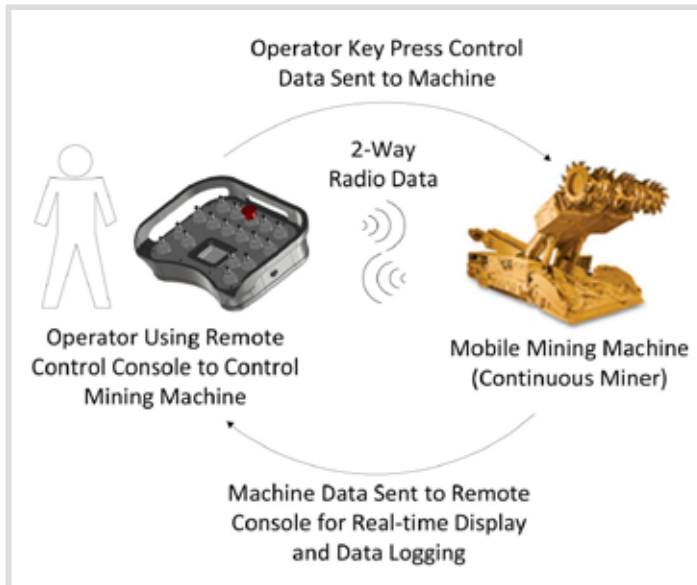


Features & Benefits

- Radio Remote Control Console is an intrinsically-safe, hand-held radio remote control handset; designed for remote control and monitoring of mobile mining equipment.
- The console features a bi-directional radio data link supporting 2-way communication with the control system fitted to the mining machine. The communication link allows operator key press commands to be sent to the machine for control. The communication link also provides a pathway for machine data to be sent back to the remote console in real time.
- A color graphics display on the top panel allows the machine to inform the operator of fault conditions and real-time operational status.
- A built-in data logging facility supports recording of machine data and console diagnostics during the operating shift. This logged data can be later extracted at the surface and used to develop reports on mining production and machine maintenance.
- The top panel of the console features a number of joysticks that can be configured as either single-axis or dual-axis control. The encoding of the radio data can also be configured to be proportional or ON/OFF for each joystick control.
- Each L0X2 model features a unique combination of function labeling and joystick configuration (number of axes, proportional or ON/OFF control).

Example Application

System Integration Options



The remote console establishes and maintains a 2-way radio data link with the control system on-board the mobile mining machine. By way of this link, any keypress commands made by the operator are sent to the machine for control purposes.

The link also allows the machine to send data back to the remote console. The remote console features an internal "Flash" memory for storing the received machine data. This allows a data logging history to be compiled of the machine performance. Mine management can later retrieve the data logging information from the remote console and use it to generate mining machine performance and reliability reports.

The LOX2 Remote Console can be adapted to a wide range of machine control applications. For each new application it is necessary for Pempek to configure the functional allocation of each control switch. The engraved top plate of the keyboard features the function nomenclature allocated to each switch.

In order for a machine control system to communicate with the remote console, a Pempek "Oracle" Radio Data Transceiver Base Station is required. The Oracle features a self-contained radio data transceiver that maintains constant communication with the remote console. The Oracle can then be controlled and monitored by the machine control system over an industry-standard fieldbus. Oracle models are available to support the following fieldbuses: RS-422, CANopen, Ethernet/IP, Ethernet Powerlink and OpenSAFETY (Ethernet Powerlink)

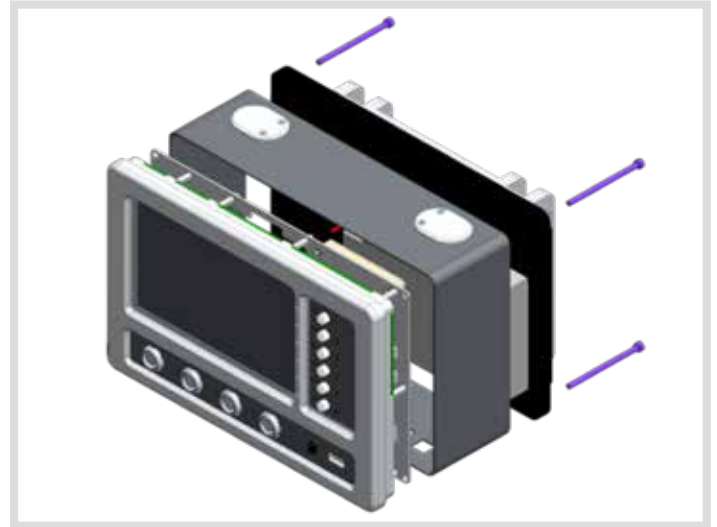
Charging Stations and Additional Remote Consoles

Battery Charging Station Part Number: L0SS0101

The SS charging station is an intelligent, touch-screen appliance used for charging and testing intrinsically-safe (IS) radio remote consoles manufactured by Pempek Systems. Up to four (4) remote consoles can be charged simultaneously from the charging station. The charger also features a built in radio transceiver for console radio communications testing.

Features & Benefits

- Multi-purpose battery charger
- Diagnostic console and machine data logging gateway for Pempek's range of hand-held radio remote control consoles
- Typically installed at the mine surface
- Charge up to four (4) remote consoles simultaneously
- Intuitive touchscreen interface allowing the operator to browse charging and operational status of each connected console
- A built-in radio data transceiver supports testing of the radio signal and function keys of the remote console before operators take it underground for the next working shift
- When the console is plugged into the charge station at the end of the working shift this machine data is transferred to the internal hard disk of the charger.
- The data remains on the charger for sixty (60) days
- The data can be collected manually (using a USB-based memory device) or the charger can be configured to push the data automatically to a mine-managed or Pempek-managed data logging servers



Typical Application

- Continuous Bolter/Miners
- Continuous Haulage
- Mobile Bolters
- Mobile Roof Supports
- Remote Control Scoops
- Remote Control Loaders
- Any intrinsically safe industrial remote control application

Additional Charging Stations

Battery Charging Station Wall Mount for XN Remotes
Part Number: L0YL0101

Battery Charger UHF 110VAC Generic
Part Number: L08M1301

Joystick for Machine Control

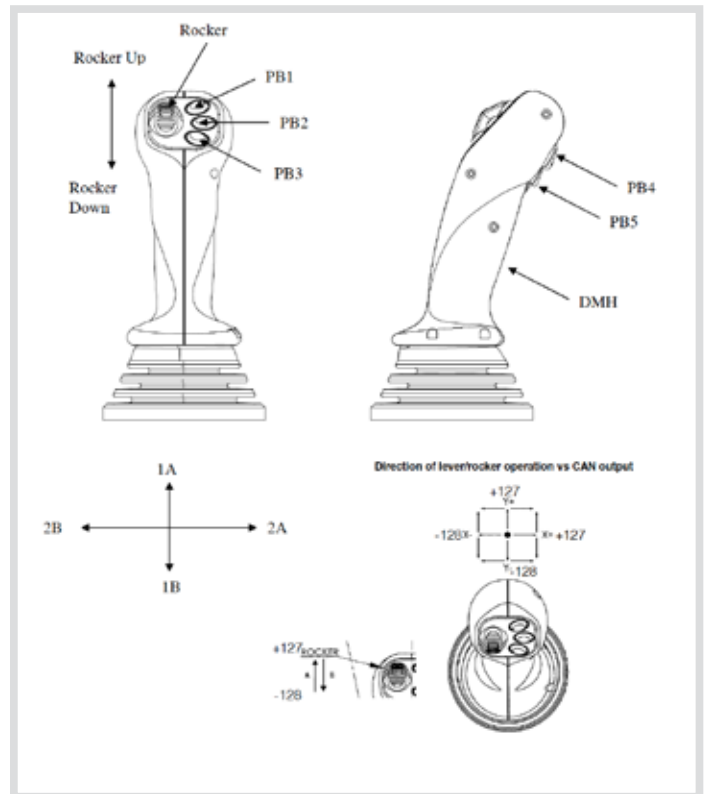
I.S. Joystick 3 Button, 2 Trigger, 1 Rocker, 2 Axis 500kBps
Part Number: L0U10401

Features & Benefits

- Joystick requires IS 12VDC supply
- CAN communication speed is 500kBps
- CAN frames are in standard format (11bits)

Typical Application

- Continuous Bolter/Miners
- Continuous Haulage
- Mobile Bolters
- Mobile Roof Supports
- Remote Control Scoops
- Remote Control Loaders



Joystick Buttons and Function Information.

Drawing Reference	Button Name	Operation	Function Description
1	A	Proportional	Y Axis
	B	Proportional	Y Axis
2	A	Proportional	X Axis
	B	Proportional	X Axis
PB1	Push Button	On/Off	B8
Rocker	Rocker Up	Proportional	Y Axis
	Rocker Down	Proportional	Y Axis
PB3	Push Button	On/Off	B12
PB2	Push Button	On/Off	B10
PB4	Push Button	On/Off	B4
PB5	Push Button	On/Off	B6
DMH	Internal Sensor	On/Off	B18

Joystick for Machine Control

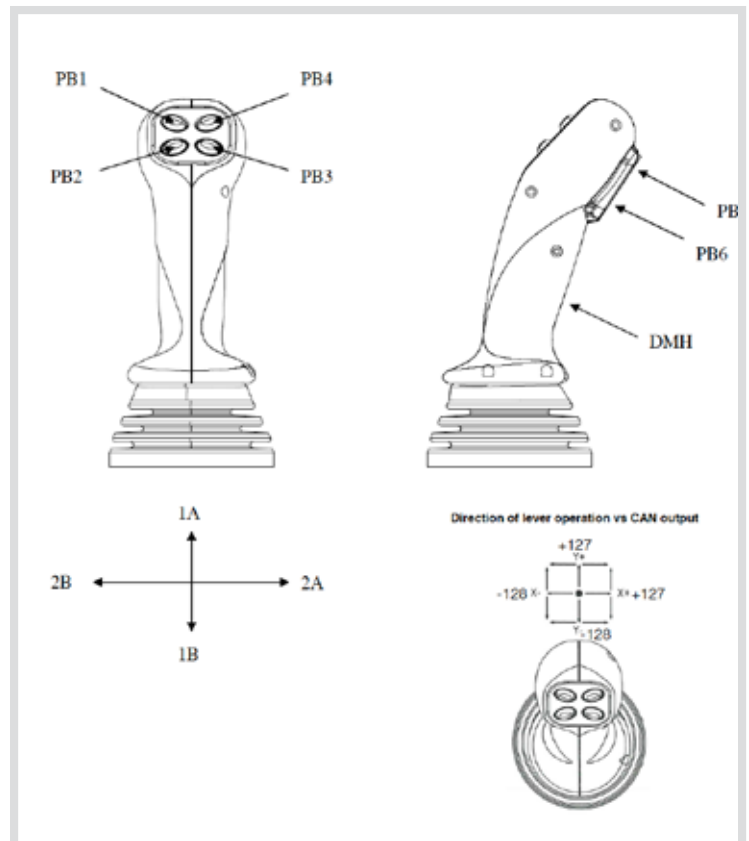
I.S. Joystick 4 Button, 2 Trigger, 2 Axis, 500kBps
Part Number: L0U10501

Features & Benefits

- Joystick requires IS 12VDC supply
- CAN communication speed is 500kBps
- CAN frames are in standard format (11bits)

Typical Application

- Continuous Bolter/Miners
- Continuous Haulage
- Mobile Bolters
- Mobile Roof Supports
- Remote Control Scoops
- Remote Control Loaders



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PB4	Push Button	On/Off	B14
PB2	Push Button	On/Off	B10
PB3	Push Button	On/Off	B12
PB5	Push Button	On/Off	B4
PB6	Push Button	On/Off	B6
DMH	Internal Sensor	On/Off	B18

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