

inteleSmart2 RECEIVER

Engineered

AC/DC Relay Receiver



MAGNETEK
RADIO CONTROLS

Part Number: 198-80102-0001 R1
November 2013
© 2013 Magnetek Material Handling

Your New Radio Receiver

Thank you for your purchase of Magnetek's Enrange® brand *inTeleSmart2* Receiver Radio Remote Equipment Control. Magnetek has set a whole new standard in radio-remote performance, dependability, and value with this line of modular receivers.

If your product ever needs modification or service, please contact one of our representatives at the following locations:

U.S. Service Information

For questions regarding service or technical information contact:

1.866.MAG.SERV

1.866.624.7378

International Service:

+1.262.783.3500

Magnetek, Inc.
N49 W13650 Campbell Drive
Menomonee Falls, WI 53051

Telephone: +1.800.288.8178

Website: www.magnetek.com

E-mail: mhcustomerservice@magnetek.com

Fax Numbers:

Main: +1.800.298.3503

Sales: +1.262.783.3510

Service: +1.262.783.3508

Canada Service Information:

4090B Sladeview Crescent
Mississauga, Ontario
L5L 5Y5 Canada
Phone: +1.800.792.7253
Fax: +1.905.828.5707
+1.416.424.7617 (24/7 Service pager)

EU Market Contact:

Brian Preston
Magnetek (UK) Ltd.
Unit 3 Bedford Business Centre, Mile Road
Bedford, MK42 9TW UK
Phone: +44.1234.349191
Fax: +44.1234.268955

©2013 MAGNETEK

All rights reserved. This notice applies to all copyrighted materials included with this product, including, but not limited to, this manual and software embodied within the product. This manual is intended for the sole use of the person(s) to whom it was provided, and any unauthorized distribution of the manual or dispersal of its contents is strictly forbidden. This manual may not be reproduced in whole or in part by any means whatsoever without the expressed written permission of MAGNETEK.

TABLE OF CONTENTS

1.	PRODUCT MANUAL SAFETY INFORMATION	5
2.	CRITICAL INSTALLATION CONSIDERATIONS.....	7
2.1	GENERAL	7
2.2	PERSONS AUTHORIZED TO OPERATE RADIO CONTROLLED EQUIPMENT	7
2.3	SAFETY INFORMATION & RECOMMENDED TRAINING FOR OPERATORS	8
2.4	PRE-OPERATION TEST	9
3.	INTELESMART2 INSTALLATION	10
3.1	PRE-INSTALLATION	10
3.2	RECEIVER UNIT MOUNTING LOCATION CONSIDERATIONS.....	10
3.3	ANTENNA MOUNTING CONSIDERATIONS.....	10
3.4	LINE INPUT CONSIDERATIONS	11
3.5	WIRING CONSIDERATION.....	11
3.6	RECEIVER/EQUIPMENT INTERFACE CONSIDERATIONS	12
3.7	RECEIVER UNIT ENCLOSURE MOUNTING	12
3.8	RECEIVER INSTALLATION	12
3.9	MECHANICAL DRAWINGS.....	13
4.	WIRING	15
4.1	ALARMS AND HORNS.....	15
4.2	POWER.....	15
4.2.1	DC Power	15
4.2.2	AC Power	15
4.3	COMMONS	16
4.4	POWER OR HOT ROUTING	16
4.5	MACHINE STOP (MC) RELAYS	16
4.6	WIRING DIAGRAMS.....	16
CONNECTING OUTPUTS TO DRIVES	18	
4.7	18	
4.8	ANALOG INPUT.....	18
4.9	DIGITAL INPUTS	18
4.10	EXPANSION MODULES	19
5.	NORMAL OPERATION.....	20
5.1	INITIALIZATION	20
6.	INTELESMART2 EXPANSION MODULE TYPES.....	21
6.1	RELAY EXPANSION MODULE	21
7.	PROGRAMMING WITH RCP	24
7.1	ACCESS CODES.....	24
7.2	CHANGING ACCESS CODES	24
7.3	CONNECTING THE INTELESMART2 TO A COMPUTER	25
7.4	PROGRAMMING WITH RCP	25
7.4.1	in <i>TeleSmart2</i> Configuration Page	28
7.4.2	Programming Page	32
7.4.3	FDP Page.....	33
7.4.4	Saving, Downloading, And Reading The Programs And Other RCP Software Functions .	34
8.	RECEIVER CHANNEL CONFIGURATION SETTINGS	36
8.1	FCC STATEMENTS.....	36
8.2	433MHz CHANNEL SET.....	37
8.3	419MHz CHANNEL SET.....	38

8.4	2.4 GHz: FHSS.....	39
9.	TROUBLESHOOTING.....	40
9.1	TROUBLESHOOTING TABLE.....	41
9.2	RECEIVER SPECIFICATIONS.....	44
9.3	ASSEMBLY AND REPLACEMENT PARTS.....	44
10.	NOTES.....	45

1. PRODUCT MANUAL SAFETY INFORMATION

Magnetek, Inc. (Magnetek) offers a broad range of radio remote control products, control products and adjustable frequency drives, and industrial braking systems for overhead material handling applications. This manual has been prepared by Magnetek to provide information and recommendations for the installation, use, operation and service of Magnetek's material handling products and systems (Magnetek Products). Anyone who uses, operates, maintains, services, installs or owns Magnetek Products should know, understand and follow our instructions and safety recommendations in this manual for Magnetek Products.

The recommendations in this manual do not take precedence over any of the following requirements relating to cranes, hoists and lifting devices:

- Instructions, manuals, and safety warnings of the manufacturers of the equipment where the radio system is used,
- Plant safety rules and procedures of the employers and the owners of facilities where the Magnetek Products are being used,
- Regulations issued by the Occupational Health and Safety Administration (OSHA),
- Applicable local, state or federal codes, ordinances, standards and requirements, or
- Safety standards and practices for the overhead material handling industry.

This manual does not include or address the specific instructions and safety warnings of these manufacturers or any of the other requirements listed above. It is the responsibility of the owners, users and operators of the Magnetek Products to know, understand and follow all of these requirements. It is the responsibility of the owner of the Magnetek Products to make its employees aware of all of the above listed requirements and to make certain that all operators are properly trained. **No one should use Magnetek Products prior to becoming familiar with and being trained in these requirements.**

WARRANTY INFORMATION

FOR INFORMATION ON MAGNETEK'S PRODUCT WARRANTIES BY PRODUCT TYPE, PLEASE VISIT WWW.MAGNETEK.COM.

WARNINGS and CAUTIONS

Throughout this document WARNING and CAUTION statements have been deliberately placed to highlight items critical to the protection of personnel and equipment.

WARNING – A warning highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in injury or death of personnel, or long term physical hazards. Warnings are highlighted as shown below:



CAUTION – A caution highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in damage to, or destruction of equipment, or loss of functional effectiveness. Cautions are highlighted as shown below:



WARNINGS and CAUTIONS SHOULD NEVER BE DISREGARDED

The safety rules in this section are not intended to replace any rules or regulations of any applicable local, state, or federal governing organizations. Always follow your local lockout and tagout procedure when maintaining any radio equipment. The following information is intended to be used in conjunction with other rules or regulations already in existence. It is important to read all of the safety information contained in this section before installing or operating the Radio Control System.

2. CRITICAL INSTALLATION CONSIDERATIONS



WARNING

PRIOR TO INSTALLATION AND OPERATION OF THIS EQUIPMENT, READ AND DEVELOP AN UNDERSTANDING OF THE CONTENTS OF THIS MANUAL AND THE OPERATION MANUAL OF THE EQUIPMENT OR DEVICE TO WHICH THIS EQUIPMENT WILL BE INTERFACED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

ALL EQUIPMENT MUST HAVE A MAINLINE CONTACTOR INSTALLED AND ALL TRACKED CRANES, HOISTS, LIFTING DEVICES AND SIMILAR EQUIPMENT MUST HAVE A BRAKE INSTALLED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

AN AUDIBLE AND/OR VISUAL WARNING MEANS MUST BE PROVIDED ON ALL REMOTE CONTROLLED EQUIPMENT AS REQUIRED BY CODE, REGULATION, OR INDUSTRY STANDARD. THESE AUDIBLE AND/OR VISUAL WARNING DEVICES MUST MEET ALL GOVERNMENTAL REQUIREMENTS. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

FOLLOW YOUR LOCAL LOCKOUT TAGOUT PROCEDURE BEFORE MAINTAINING ANY REMOTE CONTROLLED EQUIPMENT. ALWAYS REMOVE ALL ELECTRICAL POWER FROM THE CRANE, HOIST, LIFTING DEVICE OR SIMILAR EQUIPMENT BEFORE ATTEMPTING ANY INSTALLATION PROCEDURES. DE-ENERGIZE AND TAGOUT ALL SOURCES OF ELECTRICAL POWER BEFORE TOUCH-TESTING ANY EQUIPMENT. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

THE DIRECT OUTPUTS OF THIS PRODUCT ARE NOT DESIGNED TO INTERFACE DIRECTLY TO TWO STATE SAFETY CRITICAL MAINTAINED FUNCTIONS, I.E., MAGNETS, VACUUM LIFTS, PUMPS, EMERGENCY EQUIPMENT, ETC. A MECHANICALLY LOCKING INTERMEDIATE RELAY SYSTEM WITH SEPARATE POWER CONSIDERATIONS MUST BE PROVIDED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH OR DAMAGE TO EQUIPMENT.

2.1 GENERAL

Radio controlled material handling equipment operates in several directions. Cranes, hoists, lifting devices and other material handling equipment can be large, and operate at high speeds. Quite frequently, the equipment is operated in areas where people are working in close proximity to the material handling equipment. **The operator must exercise extreme caution at all times.** Workers must constantly be alert to avoid accidents. The following recommendations have been included to indicate how careful and thoughtful actions may prevent injuries, damage to equipment, or even save a life.

2.2 PERSONS AUTHORIZED TO OPERATE RADIO CONTROLLED EQUIPMENT

Only properly trained persons designated by management should be permitted to operate radio controlled equipment.

Radio controlled cranes, hoists, lifting devices and other material handling equipment should not be operated by any person who cannot read or understand signs, notices and operating instructions that pertain to the equipment.

Radio controlled equipment should not be operated by any person with insufficient eyesight or hearing or by any person who may be suffering from a disorder or illness, is taking any medication that may cause loss of equipment control, or is under the influence of alcohol or drugs.

2.3 SAFETY INFORMATION & RECOMMENDED TRAINING FOR OPERATORS

Anyone being trained to operate radio controlled equipment should possess as a minimum the following knowledge and skills before using the radio controlled equipment.

The operator should:

- Have knowledge of hazards pertaining to equipment operation
- Have knowledge of safety rules for radio controlled equipment
- Have the ability to judge distance of moving objects
- Know how to properly test prior to operation
- Be trained in the safe operation of the radio receiver as it pertains to the crane, hoist, lifting device or other material handling equipment being operated
- Have knowledge of the use of equipment warning lights and alarms
- Have knowledge of the proper storage space for a radio control receiver when not in use
- Be trained in transferring a radio control receiver to another person
- Be trained how and when to report unsafe or unusual operating conditions
- Test the receiver emergency stop and all warning devices prior to operation; testing should be done on each shift, without a load
- Be thoroughly trained and knowledgeable in proper and safe operation of the crane, hoist, lifting device, or other material handling equipment that utilizes the radio control
- Know how to keep the operator and other people clear of lifted loads and to avoid “pinch” points
- Continuously watch and monitor status of lifted loads
- Know and follow cable and hook inspection procedures
- Know and follow the local lockout and tagout procedures when servicing radio controlled equipment
- Know and follow all applicable operating and maintenance manuals, safety procedures, regulatory requirements, and industry standards and codes

The operator shall not:

- Lift or move more than the rated load
- Operate the material handling equipment if the direction of travel or function engaged does not agree with what is indicated on the controller
- Use the crane, hoist or lifting device to lift, support or transport people
- Lift or carry any loads over people
- Operate the crane, hoist or lifting device unless all persons, including the operator, are and remain clear of the supported load and any potential pinch points
- Operate a crane, hoist, or lifting device when the device is not centered over the load
- Operate a crane, hoist, or lifting device if the chain or wire rope is not seated properly in the sprockets, drum or sheave
- Operate any damaged or malfunctioning crane, hoist, lifting device or other material handling equipment
- Change any settings or controls without authorization and proper training
- Remove or obscure any warning or safety labels or tags
- Leave any load unattended while lifted
- Leave power on the radio controlled equipment when the equipment is not in operation

- Operate any material handling equipment using a damaged controller because the unit may be unsafe
- Operate manual motions with other than manual power
- Operate radio controlled equipment when low battery indicator is on



WARNING

THE OPERATOR SHOULD NOT ATTEMPT TO REPAIR ANY RADIO CONTROLLER. IF ANY PRODUCT PERFORMANCE OR SAFETY CONCERNS ARE OBSERVED, THE EQUIPMENT SHOULD IMMEDIATELY BE TAKEN OUT OF SERVICE AND BE REPORTED TO THE SUPERVISOR. DAMAGED AND INOPERABLE RADIO CONTROLLER EQUIPMENT SHOULD BE RETURNED TO MAGNETEK FOR EVALUATION AND REPAIR. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

2.4 PRE-OPERATION TEST

At the start of each work shift, or when a new operator takes control of the crane, operators should do, as a minimum, the following steps before making lifts with any crane or hoist:

Test all warning devices.

Test all direction and speed controls.

Test the receiver emergency stop.

3. INTELESMART2 INSTALLATION



WARNING

BEFORE OPERATING THE RECEIVER FAMILIARIZE YOURSELF WITH ALL SAFETY INFORMATION IN THIS MANUAL, APPROPRIATE MANUAL SUPPLEMENTS AND ANY OTHER LOCAL, STATE, OR FEDERAL RULES OR REGULATIONS ALREADY IN EXISTENCE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

3.1 PRE-INSTALLATION

1. Transmitter and receiver access code, channel, and project ID must match before the system will communicate.
2. Be aware of other radio channels in the surrounding area - set your system to a unique channel.
3. Make sure that your equipment is working properly in manual mode prior to system installation.
4. Make sure the power to the receiver is the correct voltage.
5. Disconnect equipment power prior to system installation.

3.2 RECEIVER UNIT MOUNTING LOCATION CONSIDERATIONS

Ensure the mounting location is as far as possible from exposed trolley wires and sources of electromagnetic or radiated noise as possible.

The receiver enclosure is approximately 20cm (8 in) wide by 30cm (12 in) high by 13cm (5.1 in) deep. The mounting surface must be smooth and continuous. Mounting the cabinet on uneven surfaces could cause warping or stress internal components.

If possible, avoid installing receiver unit to a surface where high vibration or shock is present. If this cannot be avoided, use appropriate shock mounts.

3.3 ANTENNA MOUNTING CONSIDERATIONS

It is best to mount the antenna so that it is visible to the operator. This is usually accomplished by mounting the antenna under the crane. However, it is not recommended to point the antenna straight down, as this will cause a "dead" spot directly under the antenna. The antenna should be mounted at a 45 degree angle perpendicular to the operator. Always try to avoid power sources, motors, drives, brakes, etc., when installing the antenna. If necessary, Magnetek offers an external antenna kit.

3.4 LINE INPUT CONSIDERATIONS



WARNING

THE UNIT MUST BE WIRED TO THE CORRECT VOLTAGE, AND BE CONNECTED TO THE CORRECT TERMINAL AS REQUIRED BY THE ACTUAL LINE VOLTAGE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

Refer to Section 4.2 for information on how to configure the unit's input power.

NOTE: The receiver unit should not be connected to lines containing excessive power up transients or continuous commutator noise. A line conditioner may be necessary in some installations.

3.5 WIRING CONSIDERATION

1. Read this manual before installation.
2. Please observe appropriate local and National Electrical Codes when wiring electrical devices.
3. Do not connect or disconnect wiring, or perform circuit checks while the power is turned on.
4. The motor wiring and the power wiring should also be in separate metal conduits.
5. Low voltage wires shall be wired with proper low voltage class wiring procedures.
6. Control wiring as well as antenna wiring shall be in separate conduit and shall be kept as short as possible.
7. All terminals shall be tightened to specified terminal torque 4.4 IN-LBS (.5 N·m), unless otherwise specified.
8. Remove excess metal screws, metal filings, and wire clippings from inside of unit.
9. Inspect to make sure no exposed wire has contact with any other wiring or terminals.
10. RC type suppressors are strongly recommended on all contactors.

3.6 RECEIVER/EQUIPMENT INTERFACE CONSIDERATIONS

All output relay contacts are rated for 10 Amps 277VAC/30VDC, 1 HP 240VAC for maximum life and surge protection, and protected with MOVs. Connection to equipment or contactors with higher voltage or current requirements will require intermediate relays.

Relay outputs K1-K12 are normally open. Relay outputs K13-K14 are flip-flop relays (flip-flop relays contain both normally open and normally closed outputs). Since a relay closure is only active while the transmitter unit key is pressed and held, devices such as lights or lifting magnets must use a mechanical auxiliary latching relay.

3.7 RECEIVER UNIT ENCLOSURE MOUNTING

When mounting the receiver, make sure to allow room for the door to swing open. Mount the receiver unit cabinet securely to the mounting surface. Actual cabinet mounting dimensions are shown in Section 3.9.

3.8 RECEIVER INSTALLATION

1. Be sure to mount the receiver antenna in direct line-of-sight of the operator and free from all obstructions.
2. Do not mount the receiver near high levels of electrical noise, such as unshielded variable frequency drives, as they may cause minor interference. When mounting the *inTeleSmart2* near unshielded variable frequency drives Magnetek typically recommends that the *inTeleSmart2* and all antenna cable routing be mounted a minimum of 24 inches from all unshielded variable frequency drives and cables.
3. Allow adequate room for mounting the receiver. Be sure to allow a minimum of 5" between the connector and nearest surface to allow for cable harness connections.
4. For best reception, and to help protect connectors from moisture and water damage, mount the receiver in an upright position.
5. If obstructions cannot be cleared, or if the unit must be mounted inside of a metal enclosure, the remote antenna should be used.
6. Do not enclose the antenna in steel. If the receiver is mounted within an enclosure, an external antenna MUST be used. For the best reception, keep all metal objects away from the antenna. Consult the factory for more information regarding your application.
7. The supply power to the *inTeleSmart2* system must have a master disconnect and should be fused.
8. It should not be necessary to set the Access Code or channel, as they are preset. If special field programming is needed, power the unit up on the bench and program the unit for any special configurations or other parameters (see Section 7 for details). The unit can be re-programmed after it is installed if necessary.
9. Position the receiver; make sure to locate it as far as possible from exposed trolley wire and sources of electromagnetic or radiated noise. Enclosure mounting dimensions and mounting can be found in Figure 1.
10. Mount the receiver. Refer to Section 3.9 for further information regarding mounting.
11. Wire the unit using the electrical drawings shown in Section 4.
12. Wire the power input for the input power type as described in Section 4.2.
13. Wiring of the system should now be complete. Install antenna.
14. If there are any problems, refer to Section 9.

3.9 MECHANICAL DRAWINGS

The receiver housing provides four mounting holes. The mounting hardware should consist of M5 (#10-24) combo drive round head screws that are 40mm (1.5 in) in length, four M5 (#10) lock washers, and four M5 (#10-24) hex nuts to mount. Lock washers should be used in front of hex nuts.

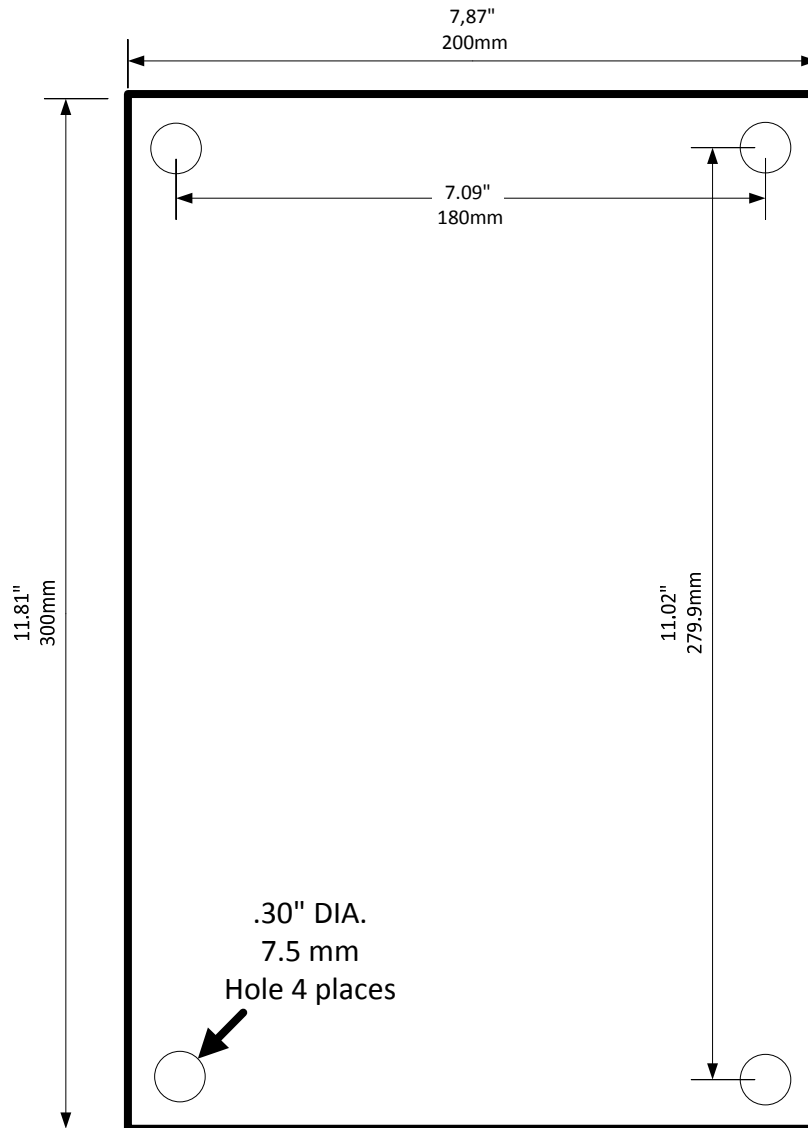


Figure 1: Housing Mounting

NOTE: Figure 1 is not to scale.

Figure 2 shows the placement of the major components used within the receiver.

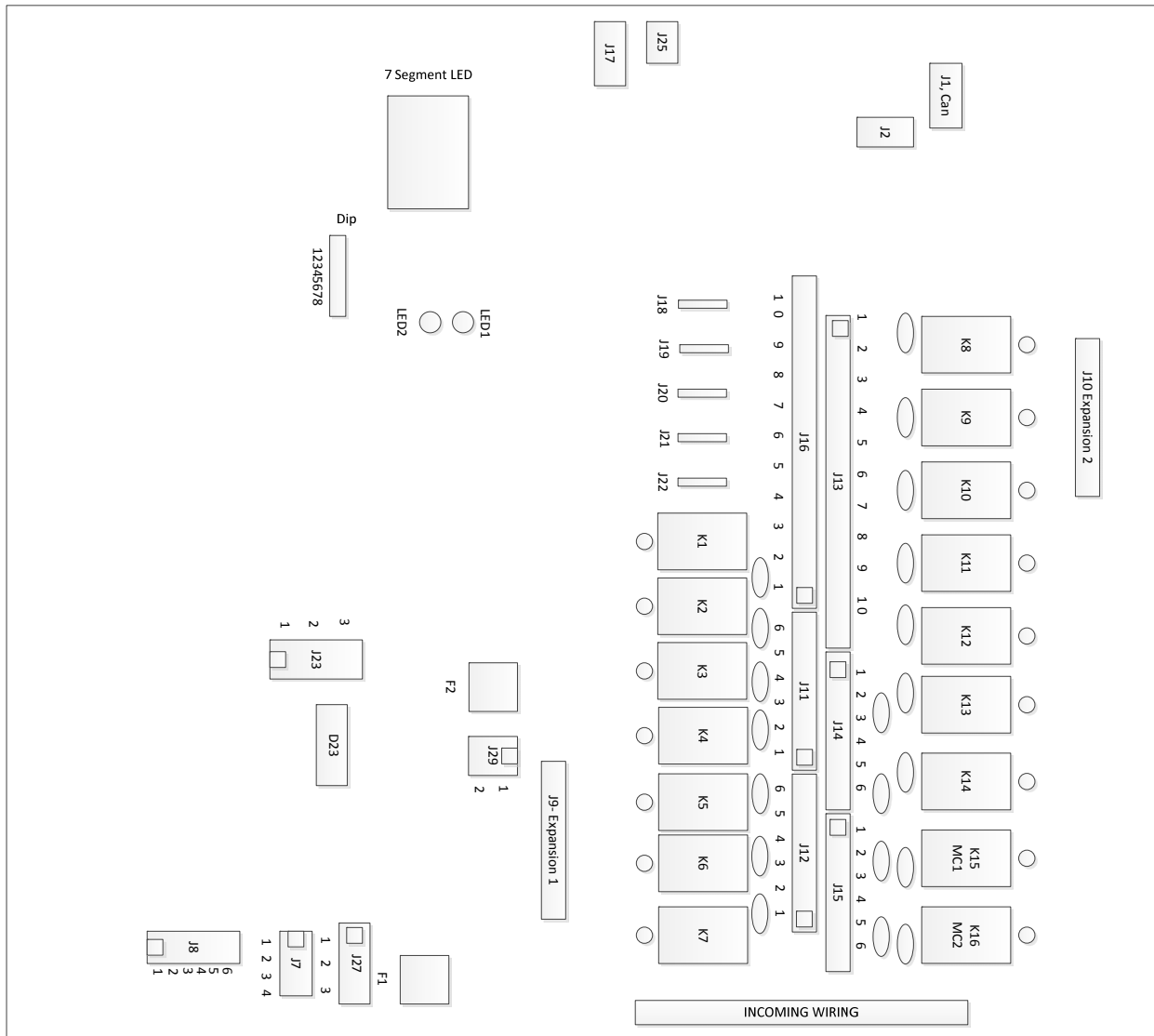


Figure 2: Main Board Component Placement

4. WIRING

4.1 ALARMS AND HORNS

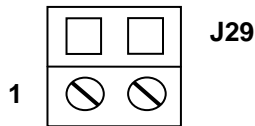
Make sure that the installation includes the proper alarms, horns, indicator lights, and their associated controls as required by local and governmental regulations.

4.2 POWER

The *inteSmart2* can be powered from 24/42/48VAC, 48/115/230VAC, or 6-36VDC. The unit needs to be configured based upon the type of input power that is being used.

4.2.1 DC Power

To power the unit with 6-36VDC, the input power needs to be connected to J29. Pin 1 is VCC and pin 2 is ground



4.2.2 AC Power

There are two different AC power transformers that can be populated within the receiver. One transformer supports 48/115/230VAC, 50/60Hz and another transformer supports 24/42/48VAC, 50/60Hz. Input voltage ranges are configured by changing the position of the wire jumper in J7. See Table 1 for the jumper settings for the 48/115/230VAC power supply.

Voltage Range	Position 1	Position 2
48VAC 36-60VAC	3	4
115VAC 85-150VAC (Default)	2	4
230VAC 190-265VAC	1	4

Table 1: 48/115/230VAC Transformer Input Power Wiring

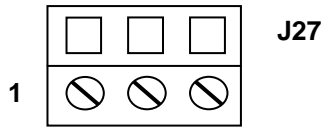
Table 2 has the jumper settings for when the 24/42/48VAC power supply is used.

Voltage Range	Position 1	Position 2
24VAC 18-36VAC (Default)	3	4
42VAC 36-48VAC	2	4
48VAC 36-60VAC	1	4

Table 2: 24/42/48VAC Input Power Wiring

NOTE: These jumper settings apply whether the AC signal is operating at 50Hz or 60Hz.

The input power then needs to be connected to J27. Pin 3 is line, pin 2 is neutral, and pin 1 is earth ground.



4.3 COMMONS

Each receiver relay output (normally open or normally closed) is independent (floating), both input and output. Relay commons (hot) are not wired together on the Receiver Board, nor are they connected to the input power. Relay common wiring must be provided by the user; this is to give total flexibility in wiring. Different motors and/or functions can use different phases or independent power sources (including DC voltage).

4.4 POWER OR HOT ROUTING

The diagrams in Section 4.6 show independent power “HOT” routed to each relay. An alternate way of routing power is to route all power to each function from the Machine Stop (MC) (K15 and K16) relays. This wiring can only be used if the total current does not exceed the Machine Stop relay ratings.

4.5 MACHING STOP (MC) RELAYS

The *inte/eSmart2* contains two relays that can be used as redundant machine stop (mainline) relays. These relays (K15 and K16) have both normally open and normally closed contacts. This is to give maximum flexibility when wiring these relays. While it is not necessary to use the redundancy provided by these relay outputs, Magnetek highly recommends that both of these be utilized.

4.6 WIRING DIAGRAMS

The CPU board of the *inte/eSmart2* contains sixteen relays. Two of these relays (K15 and K16) are used for machine stop (MC) as described in Section 4.5, and two other relays (K13 and K14) are flip-flop relays. All of the other relays (K1-K12) are normally open relays. Figure 3 shows the relay wiring for all of the relays on the CPU board.

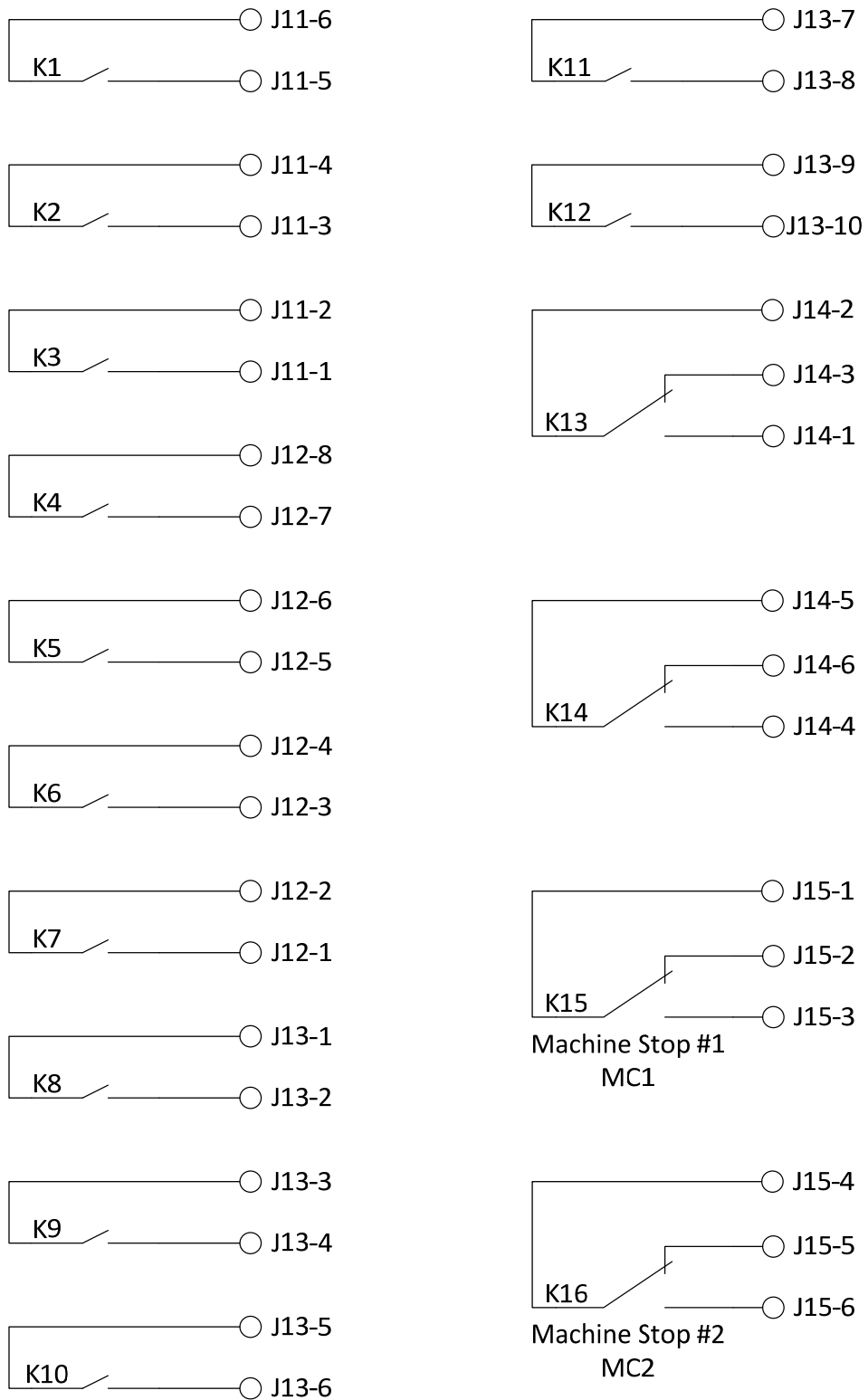


Figure 3: CPU Board Relay Wiring Diagram

4.7 CONNECTING OUTPUTS TO DRIVES

MOVs (transient protectors) are on all of the output relays to protect the relays from power surges. MOVs allow a small leakage current that can affect some high impedance circuits. When connecting output relays to drives, it may be required to remove the MOV to prevent its leakage current from holding in the drive. The MOVs are next to the relays they protect (see Figure 2 for the location of the MOVs). The MOVs can be cut out of the circuit with a wire cutter if required; ensure that ALL power is OFF to the crane and all associated controls before removing the MOVs.

4.8 ANALOG INPUT

The *inte/eSmart2* contains one analog input that can be used to interface with an analog device such as a load cell. Figure 4 shows the terminals that the analog input needs to be wired to. The analog input can support a variety of different types of analog input, including 0-5VDC, 0-10VDC, 4-20mA, and 0-20mA.

In addition, there is a reference input for the analog signal. Typically this is the ground reference from the device that the analog signal is coming from.

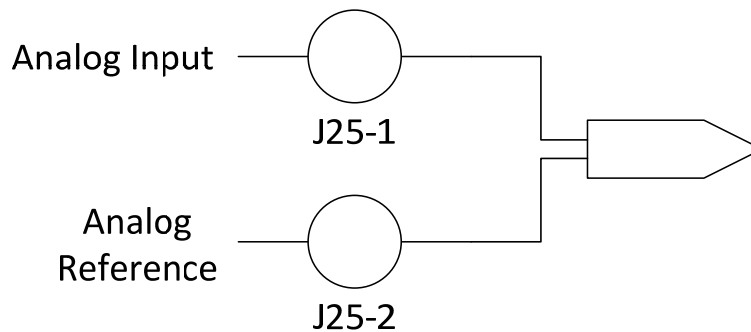


Figure 4: Analog Input Wiring

To set the analog input for 0-20mA/4-20mA, jumper J17 needs to be set to jumper positions 2 and 3. To set the analog input for 0-5VDC/0-10VDC, jumper J17 needs to be set to jumper positions 1 and 2.

4.9 DIGITAL INPUTS

The *inte/eSmart2* contains five digital inputs that can be used to interface with a digital device, such as a limit switch. There is also a reference input for each of the digital inputs. Typically the reference input is the ground reference from the device that the digital signal is coming from. The digital inputs can support either low voltage (3-36VDC) or high voltage (24-250VAC/VDC) inputs. To properly handle the low or high voltage input, a jumper needs to be moved. To enable high voltage input, the jumper needs to short jumper positions 2 and 3. To enable low voltage input, the jumper needs to short jumper positions 1 and 2. Table 3 shows the connections for each of the digital inputs and the jumper associated with changing between low and high voltage.

Input Number	Digital Input Connection	Digital Input Reference Connection	Low/High Voltage Jumper
1	J16-9	J16-10	J18
2	J16-7	J16-8	J19
3	J16-5	J16-6	J20
4	J16-3	J16-4	J21
5	J16-1	J16-2	J22

Table 3. Digital Input Connection Reference

4.10 EXPANSION MODULES

The *inte/eSmart2* has the ability to have up to two expansion modules connected. Expansion modules provide the ability to increase the capabilities of the receiver. For more information regarding expansion modules, including their wiring diagrams, refer to Section 6.

5. NORMAL OPERATION

During operation LED indicators provide status information for the *inte/eSmart2*. See Figure 2 for location of the following LEDs:

- Communication LED (LED1) – This LED will blink for every valid message received from the connected transmitter.
- Power Indicator (LED2) – This LED will turn on when power is applied to the board and valid firmware is installed.
- Relay LEDs – Each of these LEDs will light when a relay is being driven. The LEDs are located next to the relay on the board.
- Seven segment LED – This indicates the current status of the Relay Receiver. A flashing dot indicates the receiver is operating. The meaning for each of the values on the display is shown in Table 4.

Display Value	Meaning
0	No transmitter has ever connected to the receiver, OR Transmitter has been turned off, OR Transmitter out of range
1	The processor had an error during initialization
2	RF initialization error
3	Expansion module error (either no module, OR incorrect module is configured in software)
5	This indicates a transmitter is connected to the receiver and the signal strength is medium
6	Access code mismatch
7	Project ID mismatch
L	This indicates a transmitter is connected to the receiver and the signal strength is low
H	This indicates a transmitter is connected to the receiver and the signal strength is high
E	Machine stop has been pressed on the transmitter

Table 4: Seven Segment Display Values

5.1 INITIALIZATION

During initialization of the receiver, the seven segment display will show the access code and channel that the receiver is set to. The first group of digits shown is the access code. There will be a one second pause before the next set of digits is displayed. The next set of digits is the channel which the unit is set to. After the digits have finished displaying and the dot on the seven segment display is flashing, the receiver has completed initialization.

6. INTELESMART2 EXPANSION MODULE TYPES

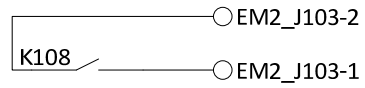
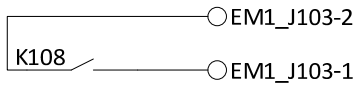
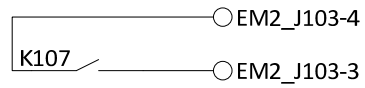
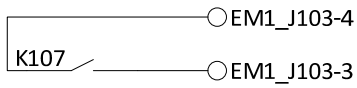
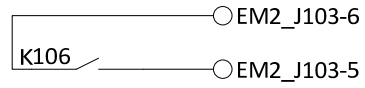
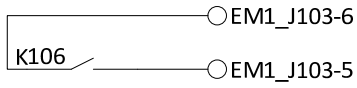
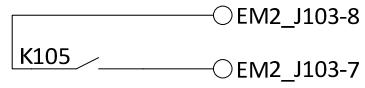
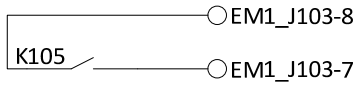
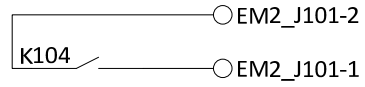
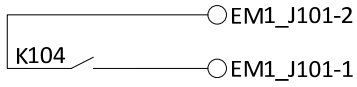
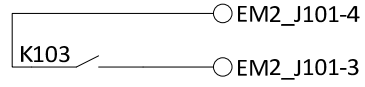
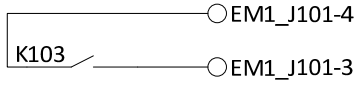
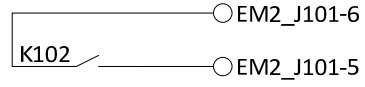
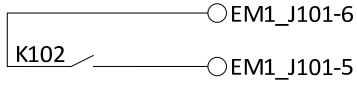
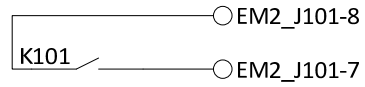
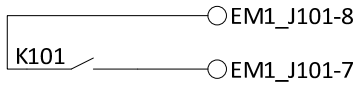
The *inteSmart2* system comprises of a CPU board that contains fourteen base relays, two machine stop relays, power supply, RF, one analog input, five digital inputs, IR, CAN, and USB. There is support to add up to two different expansion modules.

The expansion modules should be placed in J9 (expansion module 1) and J10 (expansion module 2) on the main board (Figure 2). To get the main board to allocate the correct parameters for each of the expansion modules, power the system off to put the boards in. When the system is powered back on, the software on the main board will automatically detect what type of expansion module has been inserted and make the appropriate calls to initialize the expansion module.

It is possible to place an expansion module in slot 2 (J10) without a module in slot 1 (J9) and have the system operate correctly. If the system is set up to drive I/O on an expansion module that is not present, the system will show an error.

6.1 RELAY EXPANSION MODULE

The relay expansion module allows eight normally open relays to be added to the *inteSmart2* system. Each relay has an individual input associated with it. When wiring to the relay expansion module, ensure that the correct expansion module is being wired to in order to avoid incorrect motions from being activated. Figure 5 shows the wiring diagrams for the relay expansion modules for expansion module 1 and expansion module 2.



Expansion Slot 1

Expansion Slot 2

Figure 5: Relay Expansion Module Wiring

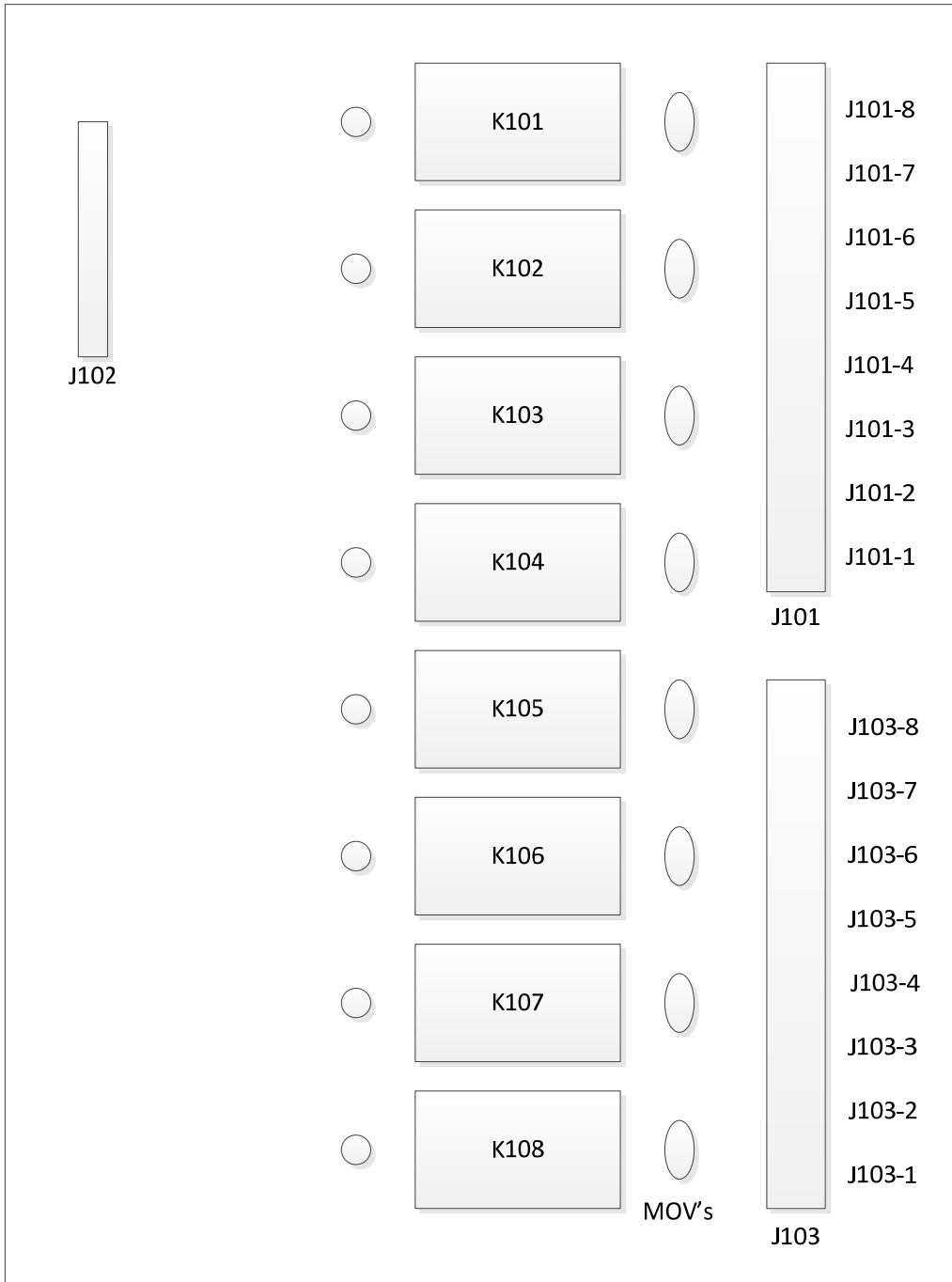


Figure 6: Relay Module Component Placement

7. PROGRAMMING WITH RCP

Using the optional RCP software makes programming of the *inteSmart2* easier and allows for settings to be saved for future reference.



WARNING

THE USE OF RCP (RADIO CONTROL PROGRAMMER) IS INTENDED FOR USE BY AUTHORIZED PERSONS ONLY. CHANGES TO ANY RADIO DATA VALUE MAY LEAD TO UNEXPECTED, UNDESIRABLE, OR UNSAFE OPERATION OF EQUIPMENT AND FURTHERMORE MAY LEAD TO EQUIPMENT DAMAGE, PERSONAL INJURY, OR EVEN DEATH. ALL EQUIPMENT OPERATORS AND/OR PERSONNEL SHOULD BE NOTIFIED OF ANY RADIO DATA VALUE CHANGES THAT MAY AFFECT OPERATION.

7.1 ACCESS CODES

The receiver and transmitter must be programmed with the same access code to properly communicate with each other.



WARNING

TWO OPERATIONAL TRANSMITTERS WITH THE SAME ACCESS CODES OPERATING AT THE SAME TIME IS A DEFINITE SAFETY HAZARD – DO NOT OPERATE THEM AT THE SAME TIME. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

7.2 CHANGING ACCESS CODES

Transmitter Access Code Programming. For detailed instructions on setting parameters, including access codes, see the “Programming” section of the applicable transmitter manual.



WARNING

AFTER CHANGING THE ACCESS CODES ON THE TRANSMITTER, TEST THE UNIT BY TURNING IT ON AND OFF NEAR THE APPROPRIATE RECEIVER. IF THE RECEIVER DOES NOT RESPOND, DO NOT ACTIVATE A FUNCTION BUTTON! THE TRANSMITTER MAY HAVE THE WRONG ACCESS CODE, WHICH COULD MOVE OTHER EQUIPMENT. RE-CHECK THE ACCESS CODE IN THE TRANSMITTER AND RETEST. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH, AND DAMAGE TO EQUIPMENT.



WARNING

THE ACCESS CODES IN THE RECEIVER ARE UNIQUE AND FACTORY PRESET. DO NOT CHANGE THESE ACCESS CODES UNLESS YOU ARE REPLACING AN EXISTING RECEIVER AND ITS ACCESS CODE. CHANGING THIS CODE COULD MAKE IT COMMON WITH ANOTHER RECEIVER ACCESS CODE, WHICH COULD MOVE OTHER EQUIPMENT. NO TWO SYSTEMS IN ANY LOCATION SHOULD EVER HAVE THE SAME ACCESS CODES INDEPENDENT OF THE FREQUENCY. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH, AND DAMAGE TO EQUIPMENT.

7.3 CONNECTING THE INTELESMART2 TO A COMPUTER

The *inteleSmart2* contains circuits that permit communication with a computer system via USB. This provides a USB-mini B plug for connection to a computer system.

When plugging in an *inteleSmart2* to a computer system, it is strongly recommended that a USB isolation hub, like Magnetek part 195-50645, is used between the *inteleSmart2* and the computer system.



WARNING

THE *inteleSmart2* CAN HAVE A DIFFERENT GROUND POTENTIAL FROM THE COMPUTER SYSTEM IT IS CONNECTED TO, AS THEY HAVE DIFFERENT POWER SOURCES. DIFFERENT GROUND POTENTIALS WILL DAMAGE EITHER THE COMPUTER SYSTEM OR THE *inteleSmart2*. AN ISOLATED USB HUB MUST BE UTILIZED TO PREVENT DAMAGE TO THE *inteleSmart2*, THE COMPUTER SYSTEM BEING CONNECTED TO THE *inteleSmart2*, OR BOTH.

7.4 PROGRAMMING WITH RCP

Read the section of the *inteleSmart2* manual regarding additional operational features to familiarize you with the features listed below. The *inteleSmart2* can be programmed using the optional RCP (Radio Control Programmer) software.

Magnetek RCP software makes the programming of the *inteleSmart2* easier and allows the programmer to store all of the *inteleSmart2* settings in files for later use or reference. The RCP software also allows the programmer to customize the *inteleSmart2* display with language descriptions that are project or machine specific. Help is provided for each function at the bottom of the RCP screen. The RCP software allows you to select frequency, access code, and communication configuration. Follow the steps below:

Install the RCP Software

Insert the USB flash drive containing RCP 2.x into a USB port on your PC. Navigate to the flash drive and locate the RCPSetup.msi file. Double clicking this file will start the install process. When the installation is complete, RCP will be installed on your PC.

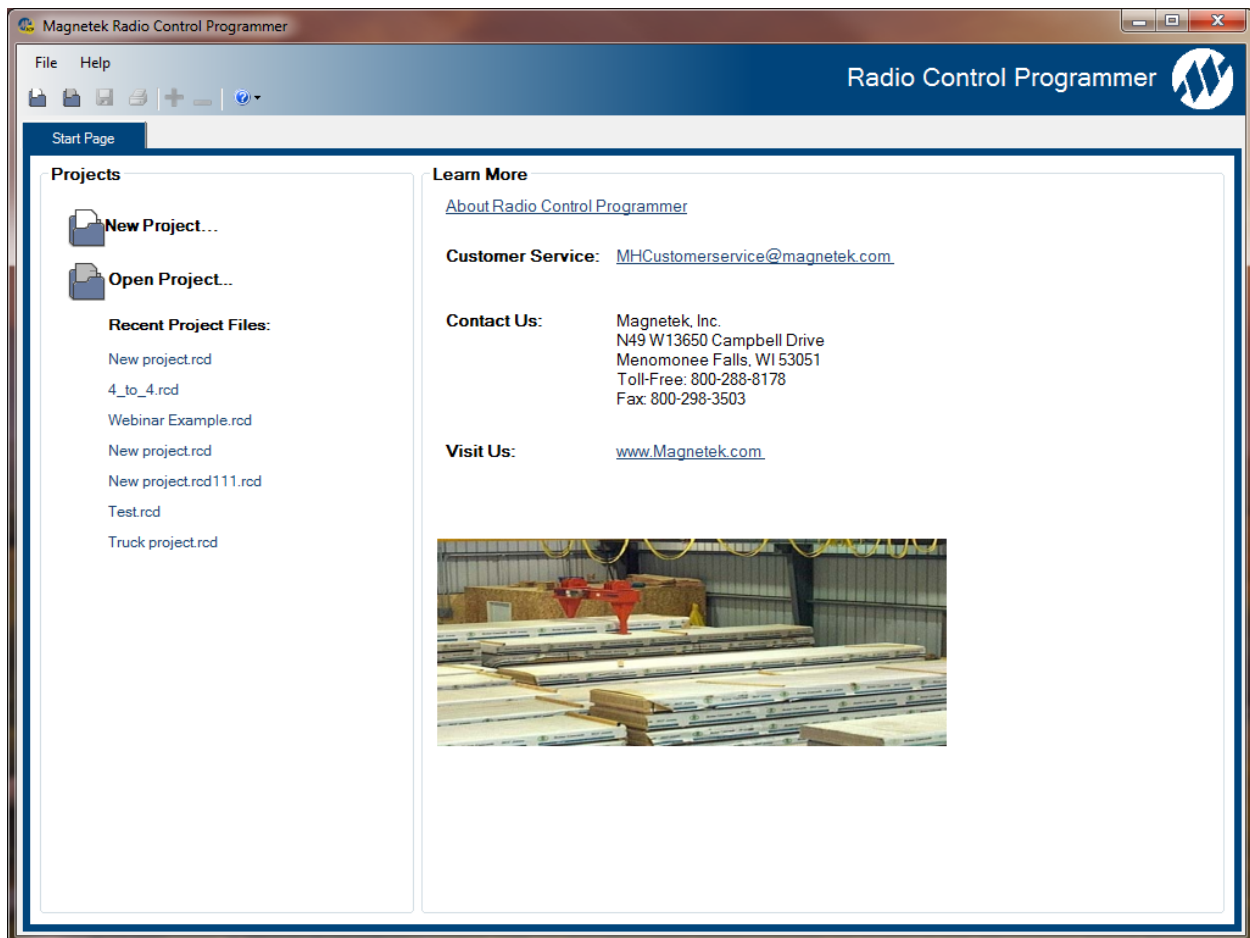
Run the RCP Software

After installation of the RCP Software, double-click the RCP icon found on the desktop to launch the program. This will prompt you to enter an activation key. If an activation key is not entered at this time, the software can only be used 10 times before locking the user out. Contact customer service or your sales representative for an activation key.



Click on New Project or Open Project

Select “New Project” if you are creating a new program file. Select “Open Project” if you want to retrieve an existing program file. A list of recent projects will appear under Open Project. Clicking on one of these will open that project. It is recommended that you create a folder in which to save all programming files.



For New Projects, Select Device Type

After the New Projects icon is selected, a menu will open listing the available device types. Select the device type that matches the product you wish to program (selecting a project type will display a picture of the product for verification).

Receive Device Data Checkbox

At the bottom of the New Project window there is a check box named "Receive Device Data" that allows the user to automatically upload the setting values on the device upon connection.

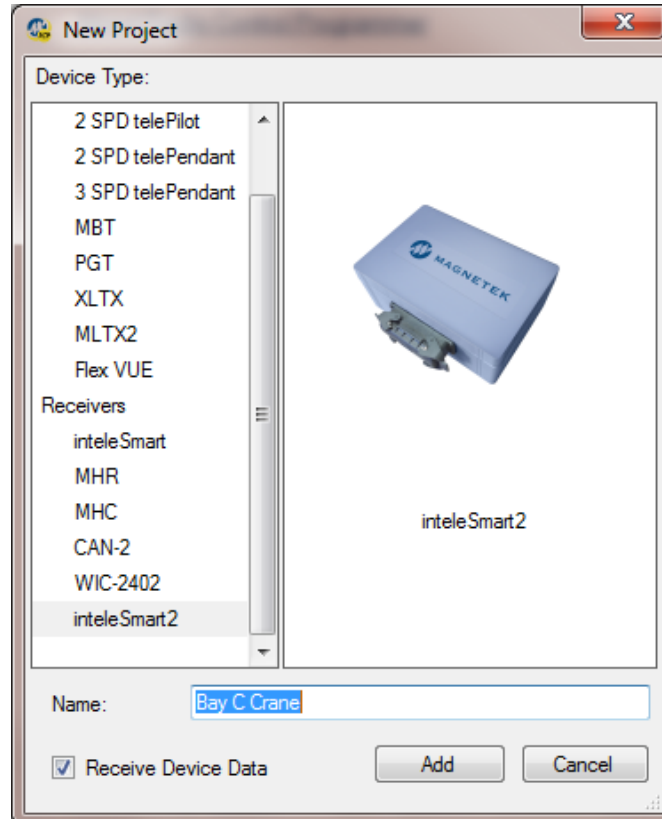
NOTE: This check box is checked by default.

Having the "Receive Device Data" box checked will cause the program to automatically read the data that is currently on the device upon clicking the Add button.



WARNING

IF THE "RECEIVE DEVICE DATA" CHECK BOX IS UNCHECKED, THE RCP PROGRAM WILL OVERWRITE ALL SETTING VALUES ON THE DEVICE WITH DEFAULT VALUES AND ANY SETTINGS CHANGED BY THE OPERATOR UPON SENDING THE PROGRAM TO THE DEVICE. ALL STORED VALUE SETTINGS WITHIN THE DEVICE WILL BE REPLACED, INCLUDING ANY PROJECT-SPECIFIC VALUES. MAGNETEK STRONGLY RECOMMENDS THAT THE "RECEIVE DEVICE DATA" CHECK BOX BE LEFT CHECKED.



This screen also allows the programmer to create a specific name for the device to help keep track of device settings and changes. It is recommended that a unique name is chosen for each device programmed with RCP.

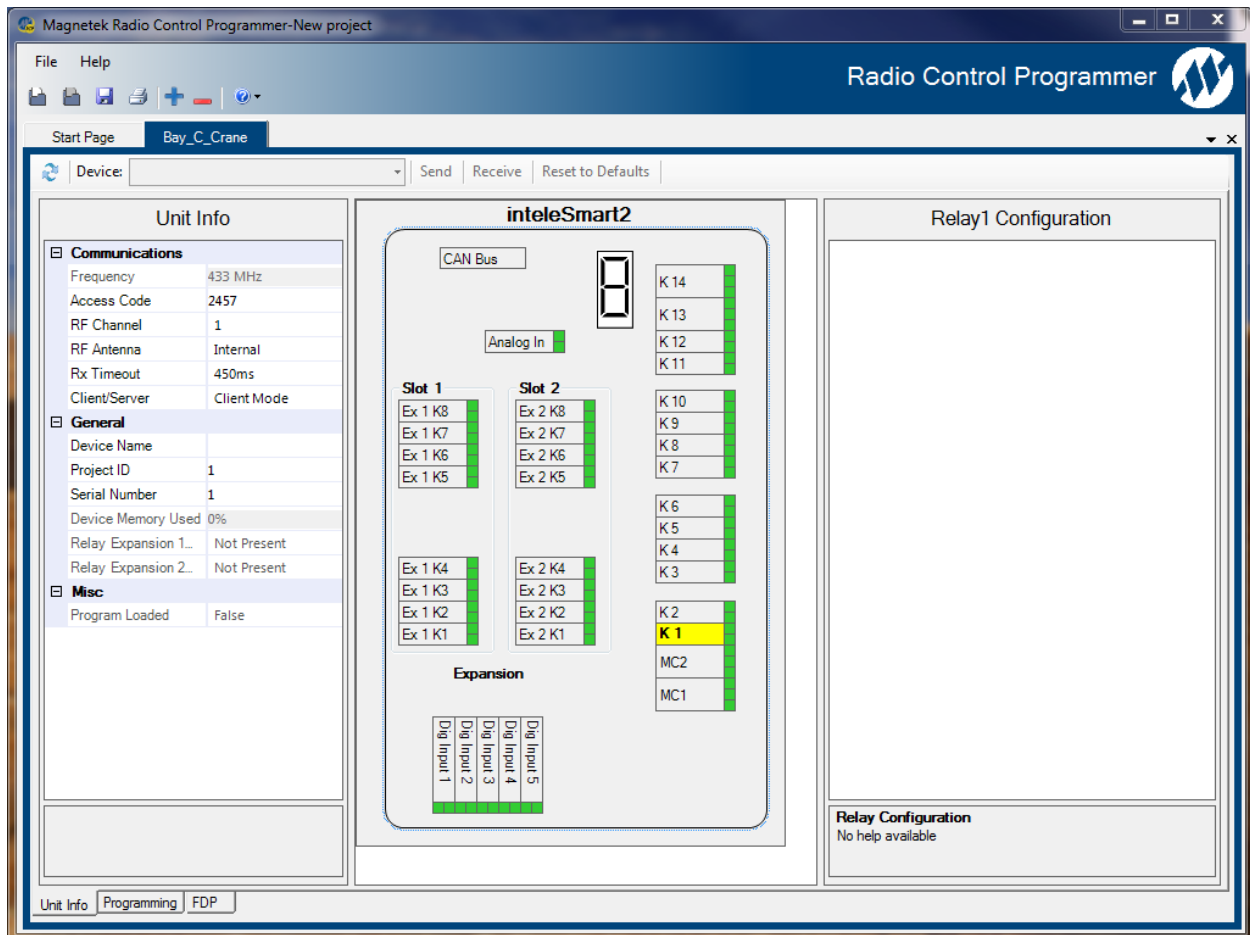
7.4.1 inTeleSmart2 Configuration Page

The inTeleSmart2 has a configurable page available to change settings on. This allows the configuration of general receiver settings (Receiver name, Access code, RF channel, etc.), displays the current setup of the Relay Receiver, and the configuration of the CAN-bus network settings.

Unit Info Page

The left section of the Unit Info page allows the user to view the receiver Project ID and serial number. The user can modify the receiver name, access code, and RF channel. This page also allows the user to select between internal or external RF antennas. This page may also be used by the user to synchronize the internal clock on the receiver with the connected PC or manually set the clock/date.

NOTE: Changing any of these details will require a reboot of the inTeleSmart2 after the new information has been sent to the device.



Frequency

This section displays the operating Radio Frequency of the receiver. The receiver Radio Frequency is set by the factory and cannot be modified by the user.

Receiver Name

The receiver name field allows the user to create a custom name for the receiver. The name can be up to 16 ASCII characters long.

Project ID

This section displays the Project ID for the unit. The Project ID is set by the factory and cannot be modified by the user.

Serial Number

This section displays the serial number for the unit. The serial number of the unit is set by the factory and cannot be modified by the user.

Access Code

The access code acts as the receiver address. The receiver will only listen to transmitters with the same address. This feature is selectable by the user.

NOTE: The transmitter must be set with the same access code as the receiver to properly communicate with each other.



WARNING

THE ACCESS CODES IN THE RECEIVER ARE UNIQUE AND FACTORY PRESET. DO NOT CHANGE THESE ACCESS CODES UNLESS YOU ARE REPLACING AN EXISTING RECEIVER AND ITS ACCESS CODE. CHANGING THIS CODE COULD MAKE IT COMMON WITH ANOTHER RECEIVER ACCESS CODE, WHICH COULD MOVE OTHER EQUIPMENT. NO TWO SYSTEMS IN ANY LOCATION SHOULD EVER HAVE THE SAME ACCESS CODES INDEPENDENT OF FREQUENCY. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH, AND DAMAGE TO EQUIPMENT.

RF Channel

The RF channel is user selectable through the pull down menu. This function is used to prevent interference with other radio devices. Refer to Section 8 for the user selectable channels for each of the frequency ranges.



WARNING

ALWAYS REMEMBER TO STORE THE PASSWORD IN A SECURE LOCATION FOR ACCESS IF THE PASSWORD IS LOST OR FORGOTTEN. ONCE THE RECEIVER IS PROGRAMMED WITH A PASSWORD, THERE IS NO WAY TO DEFEAT THE PASSWORD WITHOUT USING THE RCP SOFTWARE TO EITHER READ THE PASSWORD OR REPROGRAM A NEW PASSWORD.



WARNING

THIS PASSWORD FUNCTION IS NOT TO BE USED AS A SECURITY DEVICE. THE PURPOSE OF THIS FUNCTION IS TO PREVENT ACCIDENTAL CHANGES TO THE RECEIVER SETTINGS. THE BEST FORM OF SECURITY IS ALWAYS TO LOCK UP THE RECEIVER WHEN NOT IN SERVICE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

The password default setting is to be disabled during initial programming by the RCP software. To enable password protection, check the box next to the phrase "Activate password."



WARNING

NOT ENABLING THE PASSWORD FUNCTION ALLOWS THE RECEIVER SETTINGS TO BE MODIFIED BY ANY UNAUTHORIZED USERS. IMPROPER RECEIVER SETTINGS COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

RF Antenna

This section allows the user to select between utilizing the internal antenna that is built into the receiver or utilize the external antenna attachment (if available).

Relay Receiver Current Connections

The middle section of the Unit Info page will display how the Relay Receiver has been configured for this project, showing the connections for all the outputs and inputs.

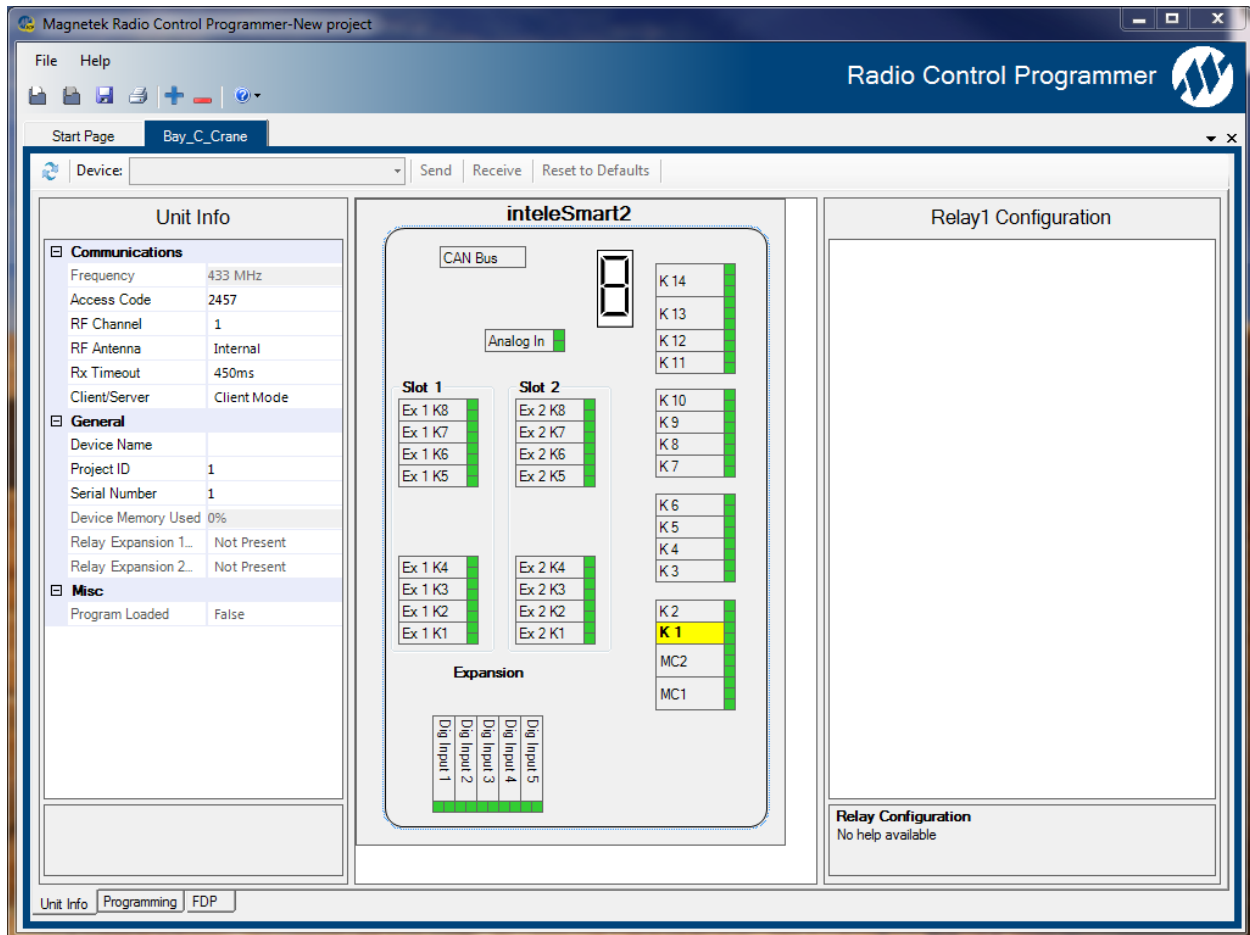
The screenshot displays the Magnetek Radio Control Programmer software interface. The window title is "Magnetek Radio Control Programmer-New project". The menu bar includes "File" and "Help". The toolbar contains icons for file operations and a "Send" button. The main area is divided into three panels:

- Unit Info:** A tree view on the left shows sections for "Communications", "General", and "Misc". The "Communications" section is expanded, showing details like Frequency (433 MHz), Access Code (2457), RF Channel (1), RF Antenna (Internal), Rx Timeout (450ms), and Client/Server (Client Mode). The "General" section shows Device Name, Project ID (1), Serial Number (1), and Device Memory Used (0%). The "Misc" section shows Program Loaded (False).
- intelSmart2:** A central panel showing the device's configuration. It includes a "CAN Bus" section with a digital display showing "00". Below it is an "Analog In" section. The "Expansion" section is divided into "Slot 1" and "Slot 2", each with five output channels (Ex 1 K8 to Ex 1 K1 and Ex 2 K8 to Ex 2 K1). To the right of these slots is a vertical list of relay outputs (K 14 to K 1, MC2, MC1). The "K 1" relay output is highlighted in yellow.
- Relay1 Configuration:** A panel on the right, currently empty, with a "Relay Configuration" section at the bottom that says "No help available".

At the bottom of the window, there are tabs for "Unit Info", "Programming", and "FDP".

CAN Configuration section

The right section of the Unit Info page allows the user to modify the CAN-bus network communication settings.



CAN

This allows the user to modify the CAN Settings.

Source Address

This is the address that the intelSmart2 will use as the source address when transmitting messages on the CAN-bus network.

Baud Rate

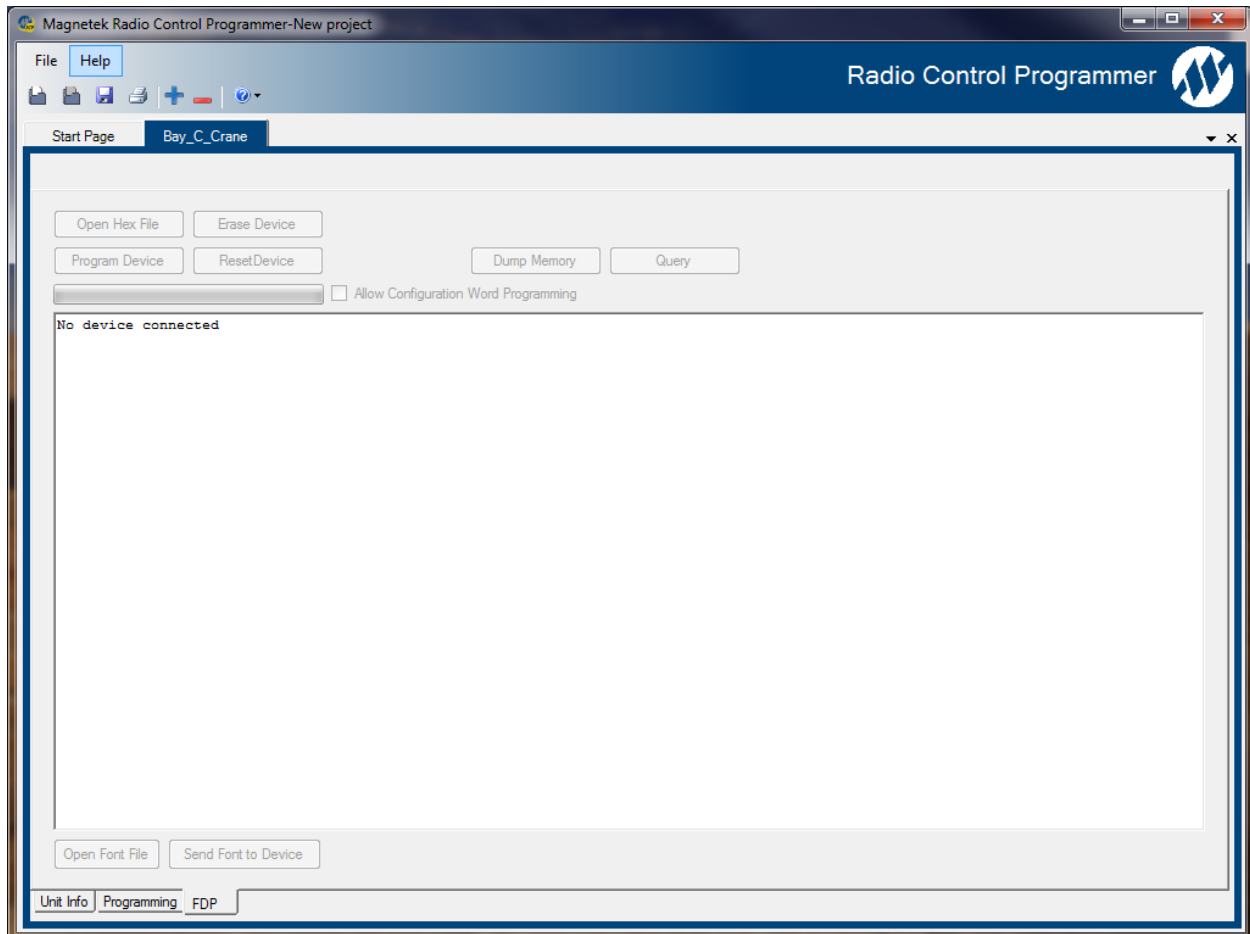
This pull-down menu allows the user to modify the communication speed of the CAN-bus network. The user selectable options are 50k, 125k, 250k and 500k.

7.4.2 Programming Page

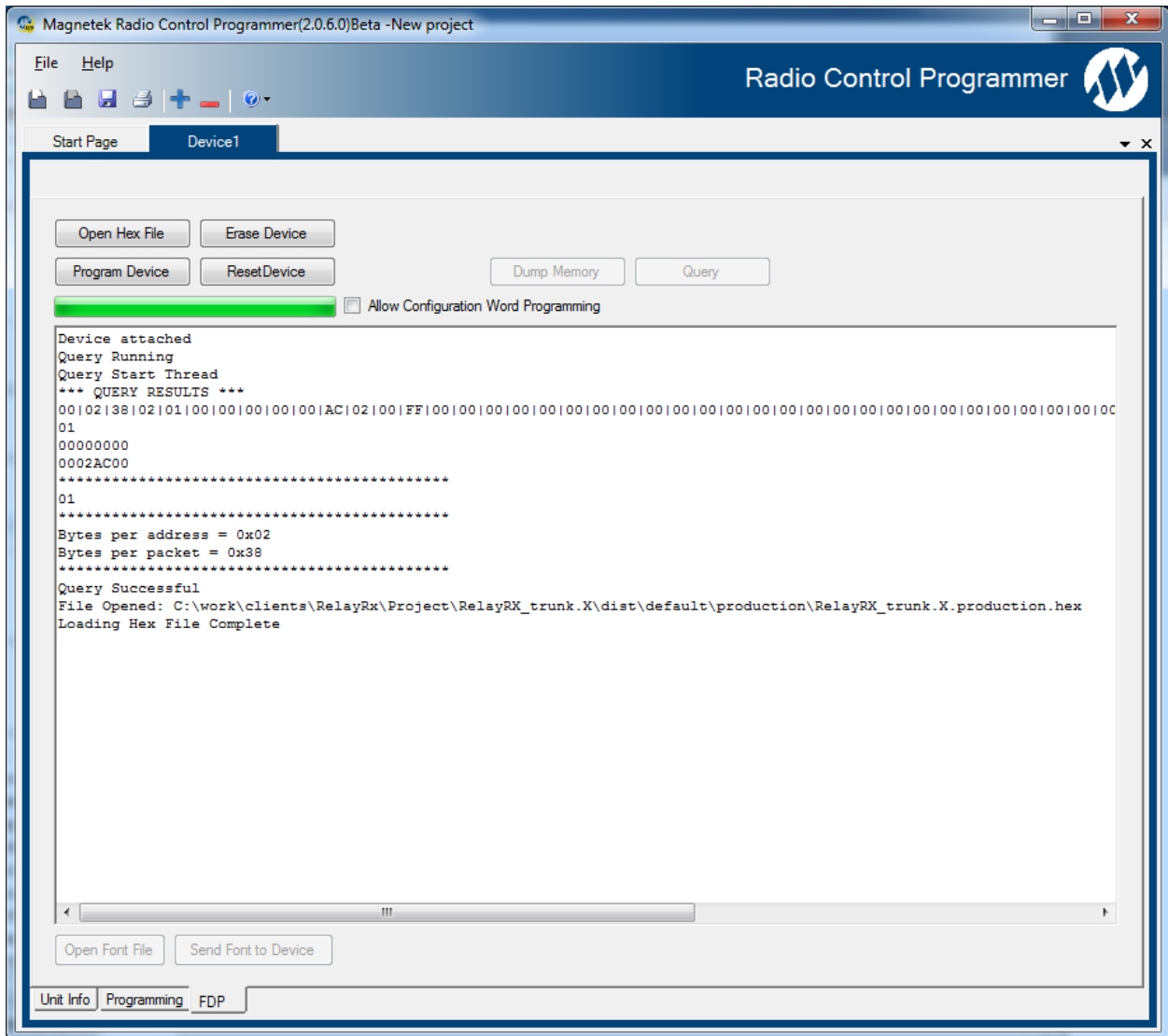
This page is currently not implemented on the Relay Receiver, but will let the user configure the Relay Receiver inputs and outputs to the user's specifications.

7.4.3 FDP Page

The FDP page is used to download firmware to the board via the bootloader. When connected during normal operation of the Relay Receiver, click on ResetDevice.



This will initiate the bootloader mode, where the new software can be downloaded. Click on Open Hex File, put in the file you want to load, then click on Program Device.



Click on ResetDevice again to start the Relay Receiver in normal operation mode.

7.4.4 Saving, Downloading, And Reading The Programs And Other RCP Software Functions



CAUTION

TO PROGRAM OR READ DATA FROM THE *int/eSmart2*, THE RECEIVER MUST BE TURNED ON.

Saving the Programming File

Once programming is complete click the file tab at the top of the RCP screen to open the file menu. File location and name can be selected from this menu. Old files can be deleted, called up, modified and renamed by this same menu.

Sending a Program to the *inteleSmart2*



WARNING

AFTER EVERY PROGRAMMING OF THE RECEIVER, TEST THE UNIT BY UTILIZING THE APPROPRIATE TRANSMITTER. IF THE RECEIVER DOES NOT RESPOND, DO NOT ACTIVATE A FUNCTION BUTTON! THE RECEIVER MAY HAVE INCORRECT PROGRAMMING. RE-CHECK THE PROGRAMMING IN THE RECEIVER AND RETEST. AFTER ACTIVATION OF THE RECEIVER, FUNCTIONALLY TEST ALL COMMANDS ON THE TRANSFORMER BY INITIALLY JOGGING THE BUTTONS, THEN WITH A FULL MOVEMENT BEFORE RETURNING TO SERVICE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

1. Plug in the USB programming cable.
2. Click the send button on the RCP screen. A dialog box will pop up to confirm if the user wants to proceed. Check the box marked "I accept," and then click the button "Continue send to radio." On-screen prompts will confirm that the receiver has been programmed or if there are any issues.
3. Data will need to be sent separately for the Unit Info, CAN Configuration, and IO screens.

Receiving (Reading) the *inteleSmart2* Programming

To read a program file from the *inteleSmart2*:

1. Plug in the USB programming cable.
2. Click "Receive" and follow on-screen prompts.
3. RCP will confirm reception and automatically display current programming in the *inteleSmart2* unit.

Reading the RCP Software Version

1. Select "Help."
2. Select "About."
3. RCP Software Version number will be displayed.

Resetting *inteleSmart2* Back to Factory Default Settings

1. Select "Reset to Defaults" button.
2. A dialog box will pop up confirming that the user wants to proceed. Click the button "OK" to restore the factory default settings. On-screen prompts will confirm that the receiver has been reset to defaults, or if there are any issues.
3. Power cycle the *inteleSmart2* to implement the factory default values.

8. RECEIVER CHANNEL CONFIGURATION SETTINGS

8.1 FCC STATEMENTS

Compliance Statement (Part 15.19)

This device complies with Part 15 of FCC rules.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance should void the user's authority to operate the equipment.

This portable transmitter with its antenna complies with FCC's RF exposure limits for general population/uncontrolled exposure.

8.2 433MHZ CHANNEL SET

Channel	Frequency
01	433.000 MHz
02	433.050 MHz
03	433.100 MHz
04	433.150 MHz
05	433.200 MHz
06	433.250 MHz
07	433.300 MHz
08	433.350 MHz
09	433.400 MHz
10	433.450 MHz
11	433.500 MHz
12	433.550 MHz
13	433.600 MHz
14	433.650 MHz
15	433.700 MHz
16	433.750 MHz
17	433.800 MHz
18	433.850 MHz
19	433.900 MHz
20	433.950 MHz
21	434.000 MHz
22	434.050 MHz
23	434.100 MHz
24	434.150 MHz
25	434.200 MHz
26	434.250 MHz
27	434.300 MHz
28	434.350 MHz
29	434.400 MHz
30	434.450 MHz
31	434.500 MHz
32	434.550 MHz

8.3 419MHZ CHANNEL SET

Channel	Frequency	Channel	Frequency
1*	418.950	44	417.500
2*	418.975	45	417.550
3*	419.000	46	417.600
4*	419.025	47	417.650
5*	419.050	48	417.700
6*	419.075	49	417.750
7*	419.100	50	417.800
8*	419.125	51	417.850
9*	419.150	52	417.900
10*	419.175	53	417.950
11*	419.200	54	418.000
12*	419.250	55	418.050
13*	419.275	56	418.100
14	416.000	57	418.150
15	416.050	58	418.200
16	416.100	59	418.250
17	416.150	60	418.300
18	416.200	61	418.350
19	416.250	62	418.400
20	416.300	63	418.450
21	416.350	64	418.500
22	416.400	65	418.550
23	416.450	66	418.600
24	416.500	67	418.650
25	416.550	68	418.700
26	416.600	69	418.750
27	416.650	70	418.800
28	416.700	71	418.850
29	416.750	72	418.900
30	416.800	73	419.350
31	416.850	74	419.400
32	416.900	75	419.450
33	416.950	76	419.500
34	417.000	77	419.550
35	417.050	78	419.600
36	417.100	79	419.650
37	417.150	80	419.700
38	417.200	81	419.750
39	417.250	82	419.800
40	417.300	83	419.850
41	417.350	84	419.900
42	417.400	85	419.950
43	417.450		

NOTE: Channels marked with * are approved for use in China

8.4 2.4 GHZ: FHSS

Channel sets are designated between 1 and 32. The frequency range is between 2402-2478 MHz. The frequency hopping protocol does not use one particular frequency to transmit a message; messages are transmitted over multiple frequencies in a predefined sequence or channel set. In doing so, this protocol is able to compensate for interference that may be present on a single frequency by sending the message across multiple frequencies.

This receiver is available with optional licensed frequencies per customer request. If utilizing a licensed frequency, please refer to the factory application documentation that was shipped with the receiver or contact the factory for licensed frequency details.

9. TROUBLESHOOTING



WARNING

THE OPERATOR SHOULD NOT ATTEMPT TO REPAIR ANY RADIO CONTROLLER. IF ANY PRODUCT PERFORMANCE OR SAFETY CONCERNS ARE OBSERVED, THE EQUIPMENT SHOULD IMMEDIATELY BE TAKEN OUT OF SERVICE AND BE REPORTED TO THE SUPERVISOR. DAMAGED AND INOPERABLE RADIO CONTROLLER EQUIPMENT SHOULD BE RETURNED TO MAGNETEK FOR EVALUATION AND REPAIR. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

9.1 TROUBLESHOOTING TABLE

Problems	Possible Reasons	Suggestions
Receiver will not power up (LED2 is off)	Power source to receiver is off	Check to make sure source power is turned on
	Power connections to the receiver are incorrectly wired	Check receiver power connection wiring as shown in Section 4.2
	Receiver fuse F1 is blown	Check and replace fuse if blown. If fuse is replaced and blows again, consult factory.
Receiver is powered on and transmitter is powered on and initialized, but there is no communication with receiver (the receiver seven segment LED is displaying 0 after initialization, receiver transmitter online LED not lighting up)	RF Channel setting in the receiver and transmitter do not match	Check to make sure the RF Channel and Access Code settings are correct by using RCP or the receiver seven segment LED. At receiver power up the seven segment LED will flash the programmed Access Code, followed by the programmed RF Channel number.
	RF module in receiver and transmitter do not match	Using RCP, check to make sure the receiver and transmitter have the same RF modules.
Receiver is powered on and transmitter is powered on and initialized, but there is no communication with receiver (the receiver seven segment LED is displaying E after initialization, communication LED3 not lighting up)	Machine stop on the transmitter was activated	Deactivate the pressed machine stop on the transmitter.
Receiver is powered on and transmitter is powered on and initialized, but there is no communication with receiver (the receiver seven segment LED is displaying 6 after initialization, communication LED3 not lighting up)	Access Code in the receiver and transmitter do not match	Using RCP, check to make sure the receiver and transmitter have the same access code.

<p>Receiver is powered on and transmitter is powered on and initialized, but there is no communication with receiver (the receiver seven segment LED is displaying 7 after initialization, communication LED3 not lighting up)</p>	<p>Project ID in the receiver and transmitter do not match</p>	<p>Using RCP, check to make sure the receiver and transmitter have the same Project ID number.</p>
<p>Receiver is powered on and transmitter is powered on and initialized, but there is intermittent communication with receiver (communication LED3 not lighting up)</p>	<p>RF Interference</p>	<p>Check to make sure there are no other transmitters or communication devices in the area using the same frequency channel.</p>
	<p>Transmitter is out of range</p>	<p>Move the transmitter closer to the receiver.</p>
	<p>Receiver antenna is missing or connection is loose</p>	<p>Check to make sure receiver antenna is attached and connected properly.</p>
	<p>Receiver antenna is incorrectly mounted</p>	<p>Reference Section 3.3 in the <i>inteSmart2</i> manual regarding proper receiver antenna mounting</p>
<p>Receiver is powered on and transmitter is powered up, initialized and communicating with receiver but no outputs are functioning (LED1 is blinking)</p>	<p>Dot on seven segment LED not flashing</p>	<p>Firmware download via RCP, or return for service.</p>
	<p>Incorrect relay configuration in receiver</p>	<p>Using RCP, verify the relay connections. Change as necessary.</p>
<p>Receiver is powered on and transmitter is powered up, initialized and communicating with receiver but no outputs are functioning (the receiver seven segment LED is displaying a 1)</p>	<p>The processor encountered an error during initialization</p>	<p>Consult factory.</p>
<p>Receiver is powered on and transmitter is powered up, initialized and communicating with receiver but no outputs are functioning (the receiver seven segment LED is displaying a 2)</p>	<p>The RF module encountered an error during initialization</p>	<p>Consult factory.</p>

Receiver is powered on and transmitter is powered up, initialized and communicating with receiver but no outputs are functioning (the receiver seven segment LED is displaying a 3)	There is an error with the configuration of the expansion module	Using RCP, verify the relay connections. Change as necessary.
The MC (Master) Relay turns off during normal operation	The transmitter powered down due to inactivity.	Extend the inactivity timeout setting for the transmitter.
	The transmitter powered down due to low batteries	Replace the transmitter's batteries.
	The COM LED stops blinking for more than 3 seconds, followed by the MC Relay turning off.	Radio interference; change the system's channel setting.
	The COM LED stopped and the MC Relay turned off together within 1 sec, possibly when engaging or disengaging another relay that is driving a contactor.	CPU module is resetting. Install snubbers across the coils of all contactors to reduce transient voltages. Ensure that the power module has a stable power source.
No response from digital input	Configuration error	Using RCP, verify that digital input is configured for the system.
	Voltage level error	Verify that digital input is correct voltage level (either 5 volts or 36 volts), and that RCP has also defined them properly.
No response from analog input	Analog voltage not detected	Verify that the jumper (J17) has pins 1 and 2 connected.
	Analog current not detected	Verify that the jumper (J17) has pins 2 and 3 connected.
Expansion module not responding	No expansion module or incorrect expansion module	The seven segment display will show a 3. Using RCP, verify the expansion module is supposed to be defined.
No response from IR connection	Cannot see the IR eye	Make sure the IR adapter has line of sight with the IR eye in the unit.
No response from USB connection	Bad USB cable	Replace the cable.
	RCP version not correct	Verify you have the latest version of RCP.
Tethered never connects	Cable not connected in unit	Verify that the tethered connector is connected to jumper J1.
	No terminating resistor	Verify that jumper J2 has pins 1 and 2 connected to have terminating resistor.
Tethered command timeouts	Bus contention	Too many devices on the CAN bus.

9.2 RECEIVER SPECIFICATIONS

Receiver housing: NEMA 4X, IP65

Operating Temperature: -30°C to +70°C (-22° F to +158° F) ambient.

Humidity: up to 95% (non-condensing).

Typical Operating Range: 400 feet (125 meters).

Relays are rated for 10 Amps 277VAC/30VDC, 1 HP 240VAC for maximum life and surge protection they are protected with MOVs.

9.3 ASSEMBLY AND REPLACEMENT PARTS

10. NOTES