

# RX-ES-CAN-HL-DT

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# User Manual

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# 1. Safety

## 1.1 Intended Use





Your Machine Control Unit (MCU) is designed for safe remote command and control of machinery and other industrial equipment alike using secure wireless communication technology. Any modification, reconstruction or extension of the purchased machine control unit without a written consent from Hetricon automatically voids the warranty on the product. Furthermore, Hetricon, as the manufacturer and supplier of the purchased MCU assumes no liability for damages resulting from the non-observance of the safety operating instructions detailed in this user manual. All personnel, working with this MCU must

- Be suitably trained and qualified as required by Operational Health and Safety regulations.
- Strictly comply with the instructions detailed in this user manual.

Before starting the MCU you must have read and fully understood the instructions in this user manual..

## 1.2 Symbol Notation

The following symbols are used in this user manual. Understand the safety message. It contains important information about personal safety on or near the unit.

	<b>STOP!</b> This symbol indicates imminent danger, risk of accident, injury or loss of life, as well as damage if instruction is not followed.
	<b>ATTENTION!</b> This symbol indicates possible damage to the MCU or Radio Remote Control system if instruction is not followed.
	<b>TIP!</b> This symbol suggests best practices for easy operation as well as prolonged life of the MCU.
	<b>INFO –</b> This symbol refers to an easily accessible quick reference note

## 1.3 Practices and Laws

Practice safe working precautions for the benefit of yourself and others.


Be alert to unsafe conditions and the possibility of minor, moderate, or serious injury or death. Learn applicable rules and laws in your area.


## 1.4 Mandatory User Training

The original purchaser of this unit received instructions from the supplier of the MCU regarding safe and proper use. If the MCU shall be used by someone other than the original purchaser — whether loaned, rented, or sold — it is imperative to always provide this user manual and all necessary safety training beforehand. Additionally, it is crucial for any new user to thoroughly read and understand the user manual of any machinery or equipment controlled by the MCU.

## 1.5 Potential Sources of Danger

This MCU is part of a system that makes remote control via wireless radio signals possible. Control commands can be transmitted even around obstacles and without the need for direct line of sight. To prevent accidental start-up and potential injury or damage, please observe the following precautions:

-  Turn the Operator Control Unit (OCU) 'OFF' when not in use.  
If the OCU does not have user access control password configured, remove the battery when the unit is placed away from the operator.

-  Disconnect the power supply from the machine control unit before any assembly, maintenance or repair work is carried out.



**PREVENT DAMAGE** – Always disconnect the power supply and control wiring from the machine control unit before welding on any part of the machine.



**NEVER** remove or alter any of the safety features on the OCU.



**ALWAYS** confirm that the machine and radio remote control Emergency and General Safe Stop functions work as intended **BEFORE** controlling the machinery or equipment remotely.

## 1.6 Security Features

The system is equipped with electro-mechanical safety features. Control signals from other OCUs cannot be processed, as transmission coding is unique to each OCU.

## 1.7 STOP in case of EMERGENCY

Push the Emergency Stop button installed on the controlled machinery or the General Safe Stop button installed on the OCU.

## 1.8 Caring for your Hetriconic Product

The enclosure materials used in the Hetriconic product have been carefully selected to minimize maintenance requirements.

## 2. Introduction and Functional Description

We congratulate you on your purchase of the new Hetronic product. You have chosen a high-quality brand. Hetronic recommends you to familiarize yourself with the control unit before using it for the first time. Please carefully read the operating instructions and safety advice provided in this manual. Only use the product as instructed and for its intended field of application. Keep these instructions in a safe place. If you pass the product on to someone else, please ensure that you also provide all corresponding documentation, including a copy of this manual.

### 2.1 Before Operating Your Wireless Control Unit

Please ensure that all radio remote control system components have been installed correctly before proceeding. Prior to startup, it's crucial to verify that both the machinery and radio remote control 'STOP' functions are in perfect working order.

Familiarize yourself thoroughly with all safety precautions outlined in the manual and review the control functions and operation of both the machinery and radio remote control system.

Always power off the MCU before conducting any maintenance work.

Remember, installation, setup, and servicing should only be carried out by authorized and qualified personnel. At Hetronic, safety and reliability are our top priorities, and we're committed to providing you with the best support every step of the way.

### 2.2 Product Rating Plate

The product rating plate holds valuable information about your control unit. It's your key to unlocking Hetronic's full service support potential.

1. Compliance Type Approvals such as CE, FCC, IC, etc.
2. Type of MCU
3. Eleven-digit Production Number
4. Eleven-digit System Number
5. Ingress Protection Rating
6. Frequency information
7. Supply voltage
8. Current rating
9. Country of Manufacture
10. Manufacturer address

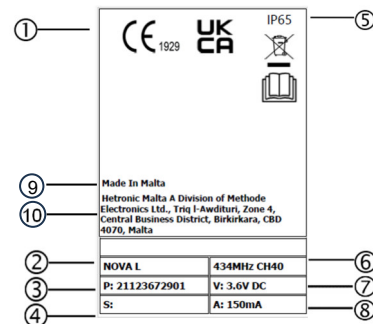


Figure 1. Product Rating Plate

### 2.3 Product Serial Numbers

Our commitment to quality service begins with your convenience! Before reaching out to your Hetronic dealer for service, repairs, or replacement parts, make sure to have the equipment Production and System numbers handy. You can find these numbers conveniently located on the product rating plate, a silver label affixed to your control unit. They're not just a code; it's a legacy of quality craftsmanship from Hetronic. Ensure that this valuable information remains legible throughout the lifetime of your product.

#### 2.3.1 Production Number

The production number, marked by the symbol 'P:', consists of 11 digits. It's not just a number; it's a window into your unit's story. The first digit reveals its manufacturing location, followed by the week and year of production represented by the next four digits. Finally, the trailing six digits offer a unique serial number for your unit.

#### 2.3.2 System Number

The system number, marked by the symbol 'S:', consists of 11 digits. The first digit reveals the manufacturing location at which the unit was uniquely paired with the machine control unit defining it as a complete radio remote control system, followed by the week and year of it was uniquely paired represented by the next four digits. Finally, the trailing six digits offer a unique serial number for your complete radio remote control system.

## 2.4 User Manual Symbol



The “Read User Manual” symbol on the MCU serves as a gentle reminder for users to thoroughly read through the manual before operating the radio remote control system. Always keep this manual in a safe and easily accessible place for quick reference when needed.

## 3. MCU Functional Description

### 3.1 Operation

The RX-ES-CANHL-DT operates as a typical radio decoder. Information transmitted by a Hetronic MCU is received by onboard RF module. Feedback transmission is Full Duplex mode by default. Control and feedback is also possible using CAN Cable Control through the CAN1 port, X1.

The Main Contact (MC) relays provide normally open (NO) or normally close (NC) contacts to the 30-pole connector. When receiving normal control data from a OCU, the contacts will be closed to provide power to the application platform. H-Link communication, system errors, OCU stop commands, and loss of communication with a OCU will cause the MC contacts to open. Each MC relay is controlled by separate microcontrollers which cross-monitor the current MC feedback status. Each microcontroller provides two control signals to provide redundant control switches for its MC relay. The MC may be configured for Static or Dynamic Start modes and provide an adjustable MC Timeout.

The application relay outputs provide SPDT (NO/NC) contacts for general use purposes. Each relay may be independently tied to the DK31 safety switch to prevent operation in stop conditions by closing J11 or J12 and opening J9 or J10. If operation of an application relay is necessary, an unswitched supply is provided by closing J9 or J10 while closing J11 or J12. J9 and J11 must not be closed at the same time. J10 and J12 must also not be closed at the same time. The operation of the relay outputs may otherwise be configured via H-Link.

Connector X2 provides 2 supply pins, 4 digital outputs, 4 analog inputs, and 2 safety control signals for general application use. The positive supply pin provides power for the 4 digital outputs. Close J1 to use the internal 5V supply for the digital outputs or open J1 and connect an external DC supply to the supply pin to use an external supply voltage.

Each digital output uses separate high- and low-side switches. Each output may be individual configured as a push-pull (high- and low-side), open-drain (low-side), or open-source (high-side) switch.

Each analog input uses the internal supply voltage for a reference level supporting 0-5VDC inputs. Using H-Link, it is possible to configure each input to act as a digital comparator with error detection. If digital operation is desired, each analog input supports up to 36VDC inputs.

The 2 safety control signals may be used externally to provide safety switching for the 4 digital outputs. The "DK31" signal is controlled by the internal DK31 signal and represents the "Active Stop" state of the decoder. The "DK32" signal is controlled by the internal DK32 signal and represents the inverted "Passive Stop" state of the decoder.

The RX-ES-CAN-HL provides two independent, isolatable CAN bus interfaces. Each bus interface is fully CANopen compliant and implements the CANopen protocol. Data sent and received from each CAN bus may be configured via H-Link using a large range of possible data sources. Received CAN data may be used for feedback, RF configuration, HDL (analog control mapping and adjustment), RCL (DKs from CAN), generic 8-bit analog inputs, or generic digital 1-bit inputs. CAN message (PDO) IDs, interval or timeout times, message lengths, and other protocol-specific parameters may also be configured via H-Link. CANopen LSS is provided for dynamic adjustment of a CAN bus's Node ID or baud rate. Additionally, several CANopen objects are accessible via SDO for dynamic system configuration.

In addition to the standard CANopen features, the RX-ES-CAN-HL provides the ability to enter the Operational state immediately on startup without waiting for NMT commands from a CANopen Master node. It is also possible to select any combination of bits within a transmit message (PDO) to trigger the message transmission upon data change.

RX-ES-CAN-HL provides 12 adjustable logic gates which allow up to 12 inputs each. Each logic gate input may be connected to a large range of internal system data and may be independently inverted. Logic gate outputs may be attached to CAN messages or to digital outputs for expanded use. Supported logic gate types are: AND, NAND, OR, NOR, and XOR.

Six relays can be added to RX-ES-CAN-HL using the REL-6X expansion board mounted in vertical RF module supports. X18 supplies +5 volts to the REL-6X that is enabled by DK31. X17 is a six-pole connector that controls each of the six REL-6X relays and is configured by H-Link

### 3.2 CAN Message Descriptions

While any transmitted CAN messages may be configured to suit the application, received CAN messages may need to be setup in particular ways for the RX-ES-CAN-HL to use them properly. For more details, please consult the CAN-HET-2 technical documentation for feedback, HDL, and RCL message formats. Brief descriptions of the supported formats are listed below.

Text LCD Feedback (Text/LED Mode, CAN-HET-2 Default COB-ID = 0x364)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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*Note: for Text/Graphic Mode, two messages with index 1 and index 2 must be received to generate 1 full feedback frame!																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Text/Graphic LCD Feedback* (Text/Graphic Mode, CAN-HET-2 Default COB-ID = 0x564)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Function	MODE1	MODE2	MODE3	MODE4	MODE5	MODE6	MODE7	MODE8	MODE9	MODE10	MODE11	MODE12	MODE13	MODE14	MODE15	MODE16	MODE17	MODE18	MODE19	MODE20	MODE21	MODE22	MODE23	MODE24	MODE25	MODE26	MODE27	MODE28	MODE29	MODE30	MODE31	MODE32	MODE33	MODE34	MODE35	MODE36	MODE37	MODE38	MODE39	MODE40	MODE41	MODE42	MODE43	MODE44	MODE45	MODE46	MODE47	MODE48	MODE49	MODE50	MODE51	MODE52	MODE53	MODE54	MODE55	MODE56	MODE57	MODE58	MODE59	MODE60	MODE61	MODE62	MODE63	MODE64	MODE65	MODE66	MODE67	MODE68	MODE69	MODE70	MODE71	MODE72	MODE73	MODE74	MODE75	MODE76	MODE77	MODE78	MODE79	MODE80	MODE81	MODE82	MODE83	MODE84	MODE85	MODE86	MODE87	MODE88	MODE89	MODE90	MODE91	MODE92	MODE93	MODE94	MODE95	MODE96	MODE97	MODE98	MODE99	MODE100	MODE101	MODE102	MODE103	MODE104	MODE105	MODE106	MODE107	MODE108	MODE109	MODE110	MODE111	MODE112	MODE113	MODE114	MODE115	MODE116	MODE117	MODE118	MODE119	MODE120	MODE121	MODE122	MODE123	MODE124	MODE125	MODE126	MODE127	MODE128	MODE129	MODE130	MODE131	MODE132	MODE133	MODE134	MODE135	MODE136	MODE137	MODE138	MODE139	MODE140	MODE141	MODE142	MODE143	MODE144	MODE145	MODE146	MODE147	MODE148	MODE149	MODE150	MODE151	MODE152	MODE153	MODE154	MODE155	MODE156	MODE157	MODE158	MODE159	MODE160	MODE161	MODE162	MODE163	MODE164	MODE165	MODE166	MODE167	MODE168	MODE169	MODE170	MODE171	MODE172	MODE173	MODE174	MODE175	MODE176	MODE177	MODE178	MODE179	MODE180	MODE181	MODE182	MODE183	MODE184	MODE185	MODE186	MODE187	MODE188	MODE189	MODE190	MODE191	MODE192	MODE193	MODE194	MODE195	MODE196	MODE197	MODE198	MODE199	MODE200	MODE201	MODE202	MODE203	MODE204	MODE205	MODE206	MODE207	MODE208	MODE209	MODE210	MODE211	MODE212	MODE213	MODE214	MODE215	MODE216	MODE217	MODE218	MODE219	MODE220	MODE221	MODE222	MODE223	MODE224	MODE225	MODE226	MODE227	MODE228	MODE229	MODE230	MODE231	MODE232	MODE233	MODE234	MODE235	MODE236	MODE237	MODE238	MODE239	MODE240	MODE241	MODE242	MODE243	MODE244	MODE245	MODE246	MODE247	MODE248	MODE249	MODE250	MODE251	MODE252	MODE253	MODE254	MODE255	MODE256	MODE257	MODE258	MODE259	MODE260	MODE261	MODE262	MODE263	MODE264	MODE265	MODE266	MODE267	MODE268	MODE269	MODE270	MODE271	MODE272	MODE273	MODE274	MODE275	MODE276	MODE277	MODE278	MODE279	MODE280	MODE281	MODE282	MODE283	MODE284	MODE285	MODE286	MODE287	MODE288	MODE289	MODE290	MODE291	MODE292	MODE293	MODE294	MODE295	MODE296	MODE297	MODE298	MODE299	MODE300	MODE301	MODE302	MODE303	MODE304	MODE305	MODE306	MODE307	MODE308	MODE309	MODE310	MODE311	MODE312	MODE313	MODE314	MODE315	MODE316	MODE317	MODE318	MODE319	MODE320	MODE321	MODE322	MODE323	MODE324	MODE325	MODE326	MODE327	MODE328	MODE329	MODE330	MODE331	MODE332	MODE333	MODE334	MODE335	MODE336	MODE337	MODE338	MODE339	MODE340	MODE341	MODE342	MODE343	MODE344	MODE345	MODE346	MODE347	MODE348	MODE349	MODE350	MODE351	MODE352	MODE353	MODE354	MODE355	MODE356	MODE357	MODE358	MODE359	MODE360	MODE361	MODE362	MODE363	MODE364	MODE365	MODE366	MODE367	MODE368	MODE369	MODE370	MODE371	MODE372	MODE373	MODE374	MODE375	MODE376	MODE377	MODE378	MODE379	MODE380	MODE381	MODE382	MODE383	MODE384	MODE385	MODE386	MODE387	MODE388	MODE389	MODE390	MODE391	MODE392	MODE393	MODE394	MODE395	MODE396	MODE397	MODE398	MODE399	MODE400	MODE401	MODE402	MODE403	MODE404	MODE405	MODE406	MODE407	MODE408	MODE409	MODE410	MODE411	MODE412	MODE413	MODE414	MODE415	MODE416	MODE417	MODE418	MODE419	MODE420	MODE421	MODE422	MODE423	MODE424	MODE425	MODE426	MODE427	MODE428	MODE429	MODE430	MODE431	MODE432	MODE433	MODE434	MODE435	MODE436	MODE437	MODE438	MODE439	MODE440	MODE441	MODE442	MODE443	MODE444	MODE445	MODE446	MODE447	MODE448	MODE449	MODE450	MODE451	MODE452	MODE453	MODE454	MODE455	MODE456	MODE457	MODE458	MODE459	MODE460	MODE461	MODE462	MODE463	MODE464	MODE465	MODE466	MODE467	MODE468	MODE469	MODE470	MODE471	MODE472	MODE473	MODE474	MODE475	MODE476	MODE477	MODE478	MODE479	MODE480	MODE481	MODE482	MODE483	MODE484	MODE485	MODE486	MODE487	MODE488	MODE489	MODE490	MODE491	MODE492	MODE493	MODE494	MODE495	MODE496	MODE497	MODE498	MODE499	MODE500	MODE501	MODE502	MODE503	MODE504	MODE505	MODE506	MODE507	MODE508	MODE509	MODE510	MODE511	MODE512	MODE513	MODE514	MODE515	MODE516	MODE517	MODE518	MODE519	MODE520	MODE521	MODE522	MODE523	MODE524	MODE525	MODE526	MODE527	MODE528	MODE529	MODE530	MODE531	MODE532	MODE533	MODE534	MODE535	MODE536	MODE537	MODE538	MODE539	MODE540	MODE541	MODE542	MODE543	MODE544	MODE545	MODE546	MODE547	MODE548	MODE549	MODE550	MODE551	MODE552	MODE553	MODE554	MODE555	MODE556	MODE557	MODE558	MODE559	MODE560	MODE561	MODE562	MODE563	MODE564	MODE565	MODE566	MODE567	MODE568	MODE569	MODE570	MODE571	MODE572	MODE573	MODE574	MODE575	MODE576	MODE577	MODE578	MODE579	MODE580	MODE581	MODE582	MODE583	MODE584	MODE585	MODE586	MODE587	MODE588	MODE589	MODE590	MODE591	MODE592	MODE593	MODE594	MODE595	MODE596	MODE597	MODE598	MODE599	MODE600	MODE601	MODE602	MODE603	MODE604	MODE605	MODE606	MODE607	MODE608	MODE609	MODE610	MODE611	MODE612	MODE613	MODE614	MODE615	MODE616	MODE617	MODE618	MODE619	MODE620	MODE621	MODE622	MODE623	MODE624	MODE625	MODE626	MODE627	MODE628	MODE629	MODE630	MODE631	MODE632	MODE633	MODE634	MODE635	MODE636	MODE637	MODE638	MODE639	MODE640	MODE641	MODE642	MODE643	MODE644	MODE645	MODE646	MODE647	MODE648	MODE649	MODE650	MODE651	MODE652	MODE653	MODE654	MODE655	MODE656	MODE657	MODE658	MODE659	MODE660	MODE661	MODE662	MODE663	MODE664	MODE665	MODE666	MODE667	MODE668	MODE669	MODE670	MODE671	MODE672	MODE673	MODE674	MODE675	MODE676	MODE677	MODE678	MODE679	MODE680	MODE681	MODE682	MODE683	MODE684	MODE685	MODE686	MODE687	MODE688	MODE689	MODE690	MODE691	MODE692	MODE693	MODE694	MODE695	MODE696	MODE697	MODE698	MODE699	MODE700	MODE701	MODE702	MODE703	MODE704	MODE705	MODE706	MODE707	MODE708	MODE709	MODE710	MODE711	MODE712	MODE713	MODE714	MODE715	MODE716	MODE717	MODE718	MODE719	MODE720	MODE721	MODE722	MODE723	MODE724	MODE725	MODE726	MODE727	MODE728	MODE729	MODE730	MODE731	MODE732	MODE733	MODE734	MODE735	MODE736	MODE737	MODE738	MODE739	MODE740	MODE741	MODE742	MODE743	MODE744	MODE745	MODE746	MODE747	MODE748	MODE749	MODE750	MODE751	MODE752	MODE753	MODE754	MODE755	MODE756	MODE757	MODE758	MODE759	MODE760	MODE761	MODE762	MODE763	MODE764	MODE765	MODE766	MODE767	MODE768	MODE769	MODE770	MODE771	MODE772	MODE773	MODE774	MODE775	MODE776	MODE777	MODE778	MODE779	MODE780	MODE781	MODE782	MODE783	MODE784	MODE785	MODE786	MODE787	MODE788	MODE789	MODE790	MODE791	MODE792	MODE793	MODE794	MODE795	MODE796	MODE797	MODE798	MODE799	MODE800	MODE801	MODE802	MODE803	MODE804	MODE805	MODE806	MODE807	MODE808	MODE809	MODE810	MODE811	MODE812	MODE813	MODE814	MODE815	MODE816	MODE817	MODE818	MODE819	MODE820	MODE821	MODE822	MODE823	MODE824	MODE825	MODE826	MODE827	MODE828	MODE829	MODE830	MODE831	MODE832	MODE833	MODE834	MODE835	MODE836	MODE837	MODE838	MODE839	MODE840	MODE841	MODE842	MODE843	MODE844	MODE845	MODE846	MODE847	MODE848	MODE849	MODE850	MODE851	MODE852	MODE853	MODE854	MODE855	MODE856	MODE857	MODE858	MODE859	MODE860	MODE861	MODE862	MODE863	MODE864	MODE865	MODE866	MODE867	MODE868	MODE869	MODE870	MODE871	MODE872	MODE873	MODE874	MODE875	MODE876	MODE877	MODE878	MODE879	MODE880	MODE881	MODE882	MODE883	MODE884	MODE885	MODE886	MODE887	MODE888	MODE889	MODE890	MODE891	MODE892	MODE893	MODE894	MODE895	MODE896	MODE897	MODE898	MODE899	MODE900	MODE901	MODE902	MODE903	MODE904	MODE905	MODE906	MODE907	MODE908	MODE909	MODE910	MODE911	MODE912	MODE913	MODE914	MODE915	MODE916	MODE917	MODE918	MODE919	MODE920	MODE921	MODE922	MODE923	MODE924	MODE925	MODE926	MODE927	MODE928	MODE929	MODE930	MODE931	MODE932	MODE933	MODE934	MODE935	MODE936	MODE937	MODE938	MODE939	MODE940	MODE941	MODE942	MODE943	MODE944	MODE945	MODE946	MODE947	MODE948	MODE949	MODE950	MODE951	MODE952	MODE953	MODE954	MODE955	MODE956	MODE957	MODE958	MODE959	MODE960	MODE961	MODE962	MODE963	MODE964	MODE965	MODE966	MODE967	MODE968	MODE969	MODE970	MODE971	MODE972	MODE973	MODE974	MODE975	MODE976	MODE977	MODE978	MODE979	MODE980	MODE981	MODE982	MODE983	MODE984	MODE985	MODE986	MODE987	MODE988	MODE989	MODE990	MODE991	MODE992	MODE993	MODE994	MODE995	MODE996	MODE997	MODE998	MODE999	MODE1000	MODE1001	MODE1002	MODE1003	MODE1004	MODE1005	MODE1006	MODE1007	MODE1008	MODE1009	MODE1010	MODE1011	MODE1012	MODE1013	MODE1014	MODE1015	MODE1016	MODE1017	MODE1018	MODE1019	MODE1020	MODE1021	MODE1022	MODE1023	MODE1024	MODE1025	MODE1026	MODE1027	MODE1028	MODE1029	MODE1030	MODE1031	MODE1032	MODE1033	MODE1034	MODE1035	MODE1036	MODE1037	MODE1038	MODE1039	MODE1040	MODE1041	MODE1042	MODE1043	MODE1044	MODE1045	MODE1046	MODE1047	MODE1048	MODE1049	MODE1050	MODE1051	MODE1052	MODE1053	MODE1054	MODE1055	MODE1056	MODE1057	MODE1058	MODE1059	MODE1060	MODE1061	MODE1062	MODE1063	MODE1064	MODE1065	MODE1066	MODE1067	MODE1068	MODE1069	MODE1070	MODE1071	MODE1072	MODE1073	MODE1074	MODE1075	MODE1076	MODE1077	MODE1078	MODE1079	MODE1080	MODE1081	MODE1082	MODE1083	MODE1084	MODE1085	MODE1086	MODE1087	MODE1088	MODE1089	MODE1090	MODE1091	MODE1092	MODE1093	MODE1094	MODE1095	MODE1096	MODE1097	MODE1098	MODE1099	MODE1100	MODE1101	MODE1102	MODE1103	MODE1104	MODE1105	MODE1106	MODE1107	MODE1108	MODE1109	MODE1110	MODE1111	MODE1112	MODE1113	MODE1114	MODE1115	MODE1116	MODE1117	MODE1118	MODE1119	MODE1120	MODE1121	MODE1122	MODE1123	MODE1124	MODE1125	MODE1126	MODE1127	MODE1128	MODE1129	MODE1130	MODE1131	MODE1132	MODE1133	MODE1134	MODE1135	MODE1136	MODE1137	MODE1138	MODE1139	MODE1140	MODE1141	MODE1142	MODE1143	MODE1144	MODE1145	MODE1146	MODE1147	MODE1148	MODE1149	MODE1150	MODE1151	MODE1152	MODE1153	MODE1154	MODE1155	MODE1156	MODE1157	MODE1158	MODE1159	MODE1160	MODE1161	MODE1162	MODE1163	MODE1164	MODE1165	MODE1166	MODE1167	MODE1168	MODE1169	MODE1170	MODE1171	MODE1172	MODE1173	MODE1174	MODE1175	MODE1176	MODE1177	MODE1178	MODE1179	MODE1180	MODE1181	MODE1182	MODE1183	MODE1184	MODE1185	MODE1186	MODE1187	MODE1188	MODE1189	MODE1190	MODE1191	MODE1192	MODE1193	MODE1194	MODE1195	MODE1196	MODE1197	MODE1198	MODE1199	MODE1200	MODE1201	MODE1202	MODE1203	MODE1204	MODE1205	MODE1206	MODE1207	MODE1208	MODE1209	MODE1210	MODE1211	MODE1212	MODE1213	MODE1214	MODE1215	MODE1216	MODE1217	MODE1218	MODE1219	MODE1220	MODE1221	MODE1222	MODE1223	MODE1224	MODE1225	MODE1226	MODE1227	MODE1228	MODE1229	MODE1230	MODE1231	MODE1232	MODE1233	MODE1234	MODE1235	MODE1236	MODE1237	MODE1238	MODE1239	MODE1240	MODE1241	MODE1242	MODE1243	MODE1244	MODE1245	MODE1246	MODE1247	MODE1248	MODE124




## 4. Pairing OCU to MCU

Standard OCUs can be paired to a different MCU, other than the one they were delivered with from the factory using either a tethered-cable approach or through a secure wireless method.

Some OCUs require the exchange of the ADMO memory key installed on the logic controller inside the OCU with new a ADMO memory pre-programmed with addresses that match those configured on the MCUs to which the OCU will be paired.

### 4.1 Address Learn via Cable

Installing the control cable as described in section 7.8.1, it is possible to put the OCU in address learn mode for pairing with a new MCU as follows.

1. Press the STOP button on the OCU. Powered ON the OCU with whilst keeping the START button pressed. During this stage the red status LED with symbol  starts blinking, confirming that the OCU logic controller is in address learn mode.
2. Release the start button and press it again. At this stage the OCU waits for the MCU to transfer its address information to the OCU. During this process the green LED on the OCU turns solidly ON. Once the logic controller on the OCU validates the received information, the new is saved to the ADMO memory of the OCU. The green LED turns OFF. However, if the received address received is not valid or the process is disrupted, the green LED remains solidly ON. If the event of an error, the OCU must be turned OFF. The pairing procedure outlined above must then be performed again.

### 4.2 Wireless Pairing

For your convenience and safety, wireless pairing involves a systematic and secure procedure.

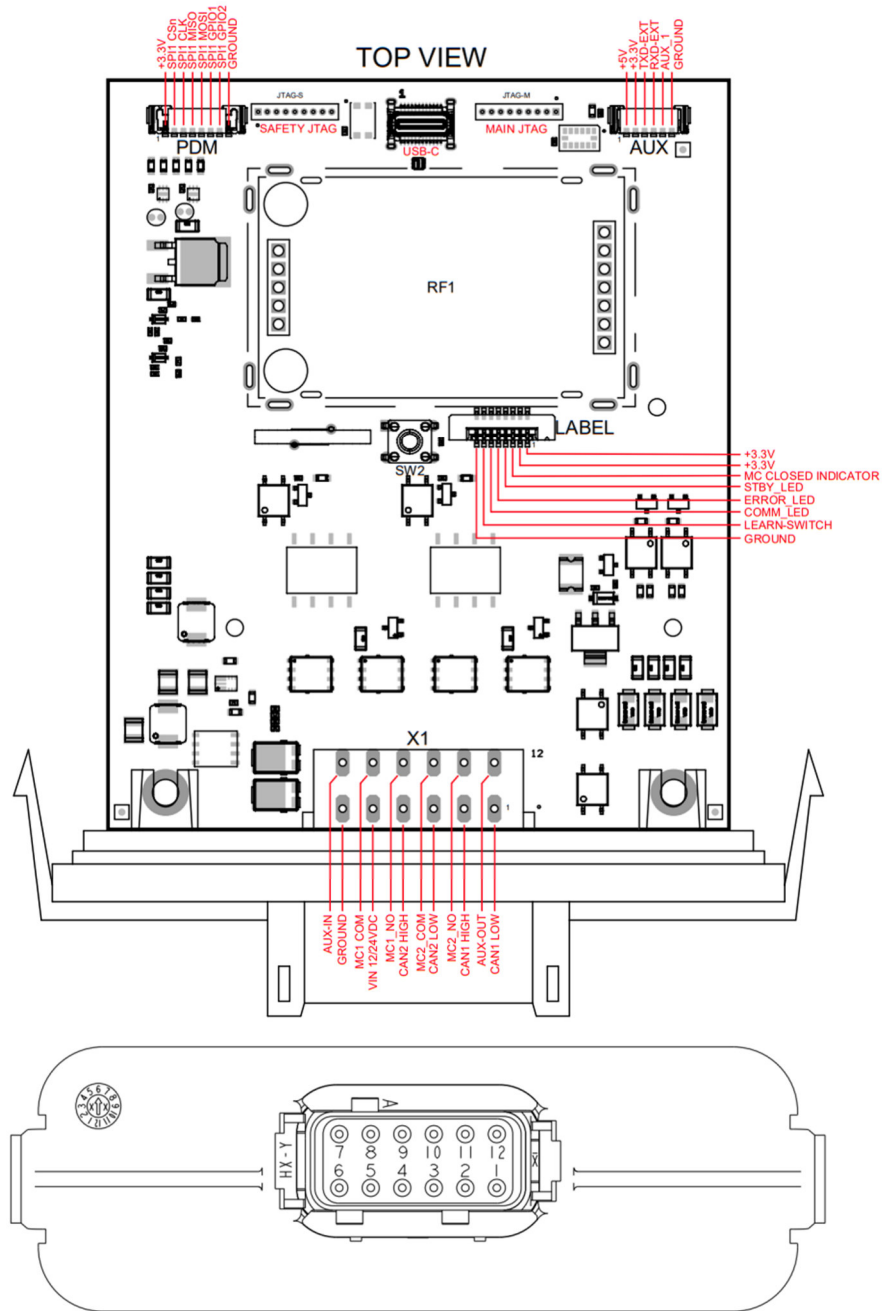
1. Ensure that both the OCU) and MCU are powered ON.
2. Initiate the pairing mode on the OCU by following the manufacturer's instructions, typically involving holding down specific buttons.

Once in pairing mode, the OCU awaits communication from the MCU to transfer its address information. This process is indicated by a visual cue, often a blinking LED. Upon successful reception and validation of the address information by the OCU's logic controller, the pairing is completed. The OCU's memory is updated with the new address, ensuring seamless communication with the MCU. Any disruption or invalid address reception prompts an error indication, necessitating a restart of the pairing procedure. Finally, the paired OCU and MCU are ready for operation, enabling remote control functionality in the industrial environment.

## 5. Technical Specifications

<b>Storage Temperature</b>	-40 °C to +85 °C
<b>Operating Temperature</b>	-20 °C to +70 °C
<b>Power Supply Voltage</b>	9 to 33Vdc
<b>Standby Current</b>	75 mA @ 12V
<b>CAN Bus</b>	Two channels CAN-FD
<b>Outputs</b>	Two Safety Relays rated at 6.0A / 32Vdc Auxiliary Output 750mA hold / 1.5A trip High-Side
<b>PCB Dimension</b>	103.5mm Length x 85.7mm Width

# 6. Connection diagram



## 7. Installing the Radio Remote Control

For a robust and dependable remote-control system, follow these vital recommendations. Entrust the installation of the remote control to skilled professionals exclusively. It's crucial to meticulously adhere to all safety instructions outlined in this manual — never overlook these essential guidelines.

Install the MCU in a strategic spot on the controlled equipment, safeguarding it and its cabling from physical harm. Securely fasten all MCU cables, shielding them against potential mechanical damage. Utilize suitable cable insulation that aligns with the field and environmental demands of your specific application.

In applications prone to significant mechanical shocks or continuous vibrations, it's strongly advised to incorporate rubber dampers or mechanical shock-absorbing buffers. These installation accessories should be integral parts of your machine's preventive maintenance routine checks. It's important to note that for sea water applications, dampers suitable for such environments must be utilized.

Guarantee that the power cable furnishes the MCU with a reliable and regulated voltage. Although the MCU possesses inherent protection against supply line irregularities, it's advantageous to proactively mitigate the risk of excess supply transients. Install surge protectors on the ground lines wherever feasible, particularly for applications operating at significant altitudes above ground level.

Steer clear of installing the MCU or its antenna in close proximity to high-power frequency inverters. It's imperative to guarantee that these inverters are properly grounded using earthing cable with a cross-section recommended by the manufacturer. This precautionary measure helps mitigate potential interference and ensures optimal performance of the MCU.

Position the MCU antenna to ensure constant line-of-sight visibility of the OCU, ensuring optimal performance at all times. This strategic placement facilitates seamless communication between the OCU and the MCU, enhancing overall system efficiency.

Steer clear of installing the antenna inside cabins, in locations with metal shielding or where its radiating element cuts through metal surfaces. Ensure the radiating element remains unobstructed at all times to optimize control range and performance. By maintaining clear visibility and avoiding interference from metal obstructions, you can ensure the best possible performance of your remote control system.

In certain applications, antenna cable extensions may be necessary to enable optimal antenna placement. It's essential to minimize the length of the antenna extension cable whenever feasible. Avoid excessive lengths of antenna extension cable, and under no circumstances should it be coiled up. Opting for the shortest possible extension length ensures optimal signal transmission and minimizes the risk of interference or signal loss.

## 8. Troubleshooting

If your system fails to operate following a standard start-up procedure, utilize the troubleshooting sequence provided below to identify the issue and implement necessary corrective measures. Should additional assistance be required, do not hesitate to reach out to your nearest Hetronic dealer for further guidance.

PROBLEM	PROBABLE CAUSE	CORRECTION
MCU does not power up	No power to the MCU	Check the diagnostic LEDs in the MCU to ensure power is applied. Ensure the system is properly grounded.
	Incorrect input voltage supplied	Check input voltage. Check requirements on drawings.
	Blown fuse in MCU	Check all fuses and replace if needed.
	Incorrect wiring	Check input voltage connections.
OCU is transmitting (Power LED flashing), but machine will not respond	No power to the MCU	Check the diagnostic LEDs in the MCU to ensure power is applied. Ensure the system is properly grounded.
	OCU/MCU frequency channels do not match	Follow instructions under "Setting Frequency and Channels" or contact your supervisor.
	OCU out of range	Take the OCU back into the range of the MCU, press START.
	MCU power off	Turn on power to MCU.
	Blown fuse in MCU	Check all fuses and replace if needed.
	STOP failure in MCU. Red STOP LED on PC board is illuminated	Contact your supervisor.
All machine motions operate intermittently	MCU antenna connection is loose or missing	Tighten or replace antenna.
	External antenna (if used) has loose connection, poor grounding, or interference	Tighten antenna and ground connection. Contact Hetronic or your dealer for more information.
	Connector inside MCU is loose	Check all connectors, reseal if needed.
	Another frequency may be interfering with the system	Contact your supervisor.
Some machine motions operate intermittently	MCU antenna connections may be loose to those specific machine motions	Check connections from the MCU to the machine motions.
	Connectors inside MCU are loose	Check all connectors, reseal if needed.
	OCU antenna connection is loose or missing	Tighten or replace antenna.
Outputs do not correspond to OCU functions	Incorrect output connections	Check system wiring. Refer to output connection diagram.

**Table 3. Troubleshooting tips**

## 9. Warranty, Service, Repair and Maintenance

For warranty inquiries, service requests, or technical assistance, please contact our Hetronic service centres on the details provided on our website at <https://hetronic.com/service/global-service-care/>. Our customer support team is available to assist you.

### 10.1 Warranty Coverage

This MCU is covered by a limited warranty. Please refer to the warranty card, your purchase agreement or contact your nearest Hetronic dealer for details on warranty coverage, terms, and conditions. The warranty provided with this MCU is subject to limitations and exclusions as outlined therein. Hetronic shall not be liable for damages resulting from improper use, maintenance, or repair of the equipment.

### 10.2 Service and Repair

For service or repair inquiries, please contact your machine manufacturer or Hetronic's authorized service centers. Attempting repairs by unauthorized personnel may void the warranty and pose safety risks.

### 10.3 Maintenance and Preventive Care Guidelines

To ensure the continued performance and safety of your remote control system, regular maintenance is recommended. Keep in mind that for your own safety and that of others, repairs and maintenance must always be carried out by qualified personnel.

- Only use original Hetronic spare parts.
- Keep the product in a clean, dry place.
- Wipe off dust using a slightly damp, clean cloth.
- Avoid the use abrasive cleaning solutions or high-pressure water jets exposing the MCU to pressures exceeding the IP rating denoted on the product rating plate.
- Do not use sharp or pointed tools to clean your MCU as these may tear the rubber parts.
- Do not use petroleum-based solvents like unleaded fuel or diesel to clean the unit as these may damage the rubber surfaces and decals on your MCU.

### 10.4 Troubleshooting Assistance

If you experience any issues with your remote control system, please consult the troubleshooting section in this manual. For further assistance, contact our customer support team.

### 10.5 Replacement Parts

Genuine replacement parts are available for your remote control system. Contact your nearest Hetronic dealer or any of our authorized local distributors for information on ordering replacement parts or alternatively reach us directly through our web shop on <https://shop.hetronic.com/mt/en/home>.

### 10.6 Safety Precautions

When performing maintenance or repairs on the remote control system, observe all safety precautions outlined in this manual. Failure to do so may result in injury or damage to the equipment.

# 10. Regulatory Information

## 10.1 Europe

Hetronic products are covered by dedicated CE declaration of conformity documents which are constantly updated to meet updates to European directives. The detailed CE declarations are delivered with the products and can also be downloaded through the Hetronic website [www.hetronic.com](http://www.hetronic.com).

### CE Compliant Machine Control Units

Hetronic hereby declares that the safety component "Radio Remote Control Type RX ES-CAN-HL-DT" listed in this manual are in compliance with Directive 2006/42/EU article 2(c) and are designed for installation on machinery or other devices. Furthermore, the listed safety components meet the requirements of Machinery Directive 2023/1230/EC and RED Directive 2014/53/EU relevant directives at the time of delivery from the Hetronic manufacturing facilities.

### Compliance to WEEE Directive



This symbol means that inoperative electrical and electronic products must not be mixed with household waste. The European Union has implemented collection and recycling system for which producers are responsible. For proper treatment, recovery, and recycling, please dispose of the product in a designated collection point.

### Compliance to REACH Directive

Hetronic confirms that, to the best of its knowledge and continual communication with its respective suppliers, chemical Substances of Very High Concern (SVHC) are not included in our products. Based on the response statements of our suppliers no materials from the ECHA are included on Hetronic products. For the latest version of the complete Declaration of Conformity please visit the Hetronic website at [www.hetronic.com](http://www.hetronic.com).

### Compliance to RoHS Directive

As a designer and manufacturer of electrical and electronic products covered by RoHS, RoHS2 and RoHS3, Hetronic confirms that to the best of its knowledge at the date of this statement, none of the products supplied by it contain any of the hazardous substances in excess of permitted levels referred to in the European Directive (EU) 2017/2102. The latest version of the complete Declaration of Conformity is available on the Hetronic website at [www.hetronic.com](http://www.hetronic.com).

## 1.1 North America

### FCC COMPLIANCE NOTIFICATIONS

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

WARNING: The OEM must ensure that FCC labeling requirements are met. This includes a clearly visible label on the outside of the OEM enclosure specifying the appropriate Hetronic FCC identifier for this product below:

- "Contains FCC ID: LW9-CSM2400FH"
- "Contains IC: 2119B-CSM2400FH"

### California Proposition 65

As a designer and manufacturer of electrical and electronic products, Hetronic confirms that to the best of its knowledge at the date of this statement, none of the products supplied by it contain any of the hazardous chemicals listed on California's Safe Drinking Water & Toxic Enforcement Act of 1986 (commonly known as California Proposition 65).

### FCC Recommendations:

This device complies with Part 15 of the 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.

To comply with FCC RF exposure compliance requirements, this device and its antenna must not be co-located with, or operating in conjunction with, any other antenna or MCU.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and MCU.
- Connect the equipment into an outlet on a circuit different from that to which the MCU is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## 1.2 Industry Canada (IC/ISED) Statement

### For Canadian User

#### CAN ICES-3 (B)/NMB-3(B)

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

### IC RF Exposure Statement

The Hetronic CSM2400FH meets the RF exposure requirement of low-power devices under portable operation. This device should be operated with a minimum distance of 20mm (2 cm) between the antenna and your body. Do not touch or move the antenna while the unit is transmitting or receiving.

"Le Hetronic CSM2400FH répond aux exigences d'exposition aux RF des appareils à faible puissance en fonctionnement portable. Cet appareil doit être utilisé avec une distance minimale de 20 mm (2 cm) entre l'antenne et votre corps. Ne touchez pas et ne déplacez pas l'antenne pendant que l'unité émet ou reçoit."



**IC Warning**

## SED RSS-Gen Notice

"This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device."

"Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage;
2. l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."



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## Appendix A - Definition of terms

The following terms abbreviations are used throughout this user manual.

Term	Definition
ADMO	Address Module – The memory chip inside the OCU storing the OCU configuration
AUTX	Automatic Transmit
Base address	The base address is the Hetronic PC-Link assigned address of the coder
Baud rate	The transmission (rate) speed measured in bits per second.
FCS	Frequency Channel Search
Hamming distance	A measurement of data transmission safety. The amount of failures in the data stream which has to occur during the transmission in order to create a wrong signal
MCU	Machine Control Unit – the logic control unit installed on the controlled equipment that is paired with the OCU
OCU	Operator Control Unit – The portable radio remote control unit
RF	Radio Frequency
Scan-Group	A collection of fixed frequency channels under one group which are used in scan mode

## Appendix B – Safety Instructions

### B.1 User Safety Precautions

Before starting your shift, you should make sure that the equipment has a current inspection certificate and that the necessary inspections and risk assessment checks have been carried out and are up to date. Also, the equipment must be operated in accordance with the manufacturer's instructions.

Furthermore, it is of utmost importance that you know that **YOU are primarily responsible for YOUR OWN health and safety**. Wear appropriate Personal Protective Equipment and make sure that you have had all the necessary training to operate the equipment. The following basic safety precautions must be adhered to at all times:

1. OCU switches must never be mechanically blocked ON or OFF for any motion. When not in use the OCU must be turned off. A safe and secure storage space should be provided for the OCU unit and the unit should always be placed there when not in use. This precaution will prevent unauthorized people from operating the crane. MCU must be removed from the equipment when it is unlikely that it will be used for a period of time, and properly stored.
2. All defective or missing safety equipment, mechanical or electrical defects must be reported to the supervisor without delay. Operation must not continue until all required repairs are completed. Any changes to the condition of the remote or equipment must be recorded and communicated to or made accessible by the following operators on shift.
3. Ensure that there is nobody in the path of the travel of the equipment. If there is, stop and sound the alarm before proceeding.
4. When leaving the equipment area for any reason, switch off the OCU, remove the key cap and store it in a safe and secure place to prevent unauthorized operation.
5. Do not allow any unauthorized person to operate the OCU at any point.
6. Do not operate the OCU at a distance where the equipment and all surrounding objects are not visible. Make sure that your view is not obstructed.
7. Do not attempt to override any of the safety features built into the Radio Remote Control.
8. Use protective gloves when surface temperature of unit exceeds 58°C (136°F) as per IEC 62368-1:2014.

## B.2 Safety Checklist

The following checklist provides general safety guidelines for radio control operation of equipment by fully qualified and trained operators. These recommendations do not take precedence over any of the following requirements relating to cranes, hoists, lifting devices or other equipment which use or include Hetronic products:

- Instructions, manuals, and safety warnings of the manufacturers of the equipment where Hetronic products are used,
- Plant safety rules and procedures of the employers and the owners of the facilities where the Hetronic products are being used,
- Occupational Health and Safety Administration (OSHA) regulations,
- Safety standards and practices for the industries in which Hetronic products are used.

OCU Start-up and Safety Checklist		
1	Are screws/bolts fully tightened?	
2	Is the MCU housing free from cracks and damages?	
3	Are the control, connection, and antenna cables free from kinks and damages?	
4	Is the STOP function working as it should be?	
5	Is the antenna properly tightened and placed in the correct position/orientation?	
6	Are the cables inserted correctly and glands/seals tightened enough such that no water ingress is possible?	
7	Is the correct input voltage to be supplied?	
8	Are the wires connected to the correct pin-outs/connections?	
9	Are there any metal structures in the vicinity of the antenna?	