Document Title:

D000-002

eTarget HEXTA-001 Range Setup Instructions
Revision D

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Revision History

Revision	Author	Date	Short Descriptions
A	DK	4Sept10	Original Document Issue
B	VG	10/30/10	Corrected typos
C	DK	22/02/11	Re-developed: HUB introduction
D	DK	02/03/11	Fixed typos, Power Injection section changed

Review History

Revision	Author	Date	Short Descriptions
A	DK	4Sept09	Original Document Issue
B	DK	10/30/10	Accepted
C	VG	25/02/11	Accepted
D	VG	02/03/11	Accepted

Definitions

Term	Description
eTarget	Electronic target
CAT5 cable	Widely available network cable. Managed by any network technician
RJ45	A standard connector for CAT5 network cable. Managed by any network technician.
RJ11	A standard connector for telephone cable. Managed by any network or telephone technician.

Related Documents

Term	Description
D000-004	eTarget HEXTA-001 Maintenance description
D000-005	eTarget HEXTA-001 Shooter Station description
LED	Light Emitted Display - a 2 segment display on the target CPU module
LCD	Liquid Crystal Display - a display on the front panel of the HUB

1 Summary

This document describes how to setup an eTarget system on a range before shooting activities. It also describes maintenance of the equipment after shooting activities.

The eTarget system requires some maintenance and periodic service, which is described in detail in eTarget HEXTA-001 Maintenance document (D000-005):
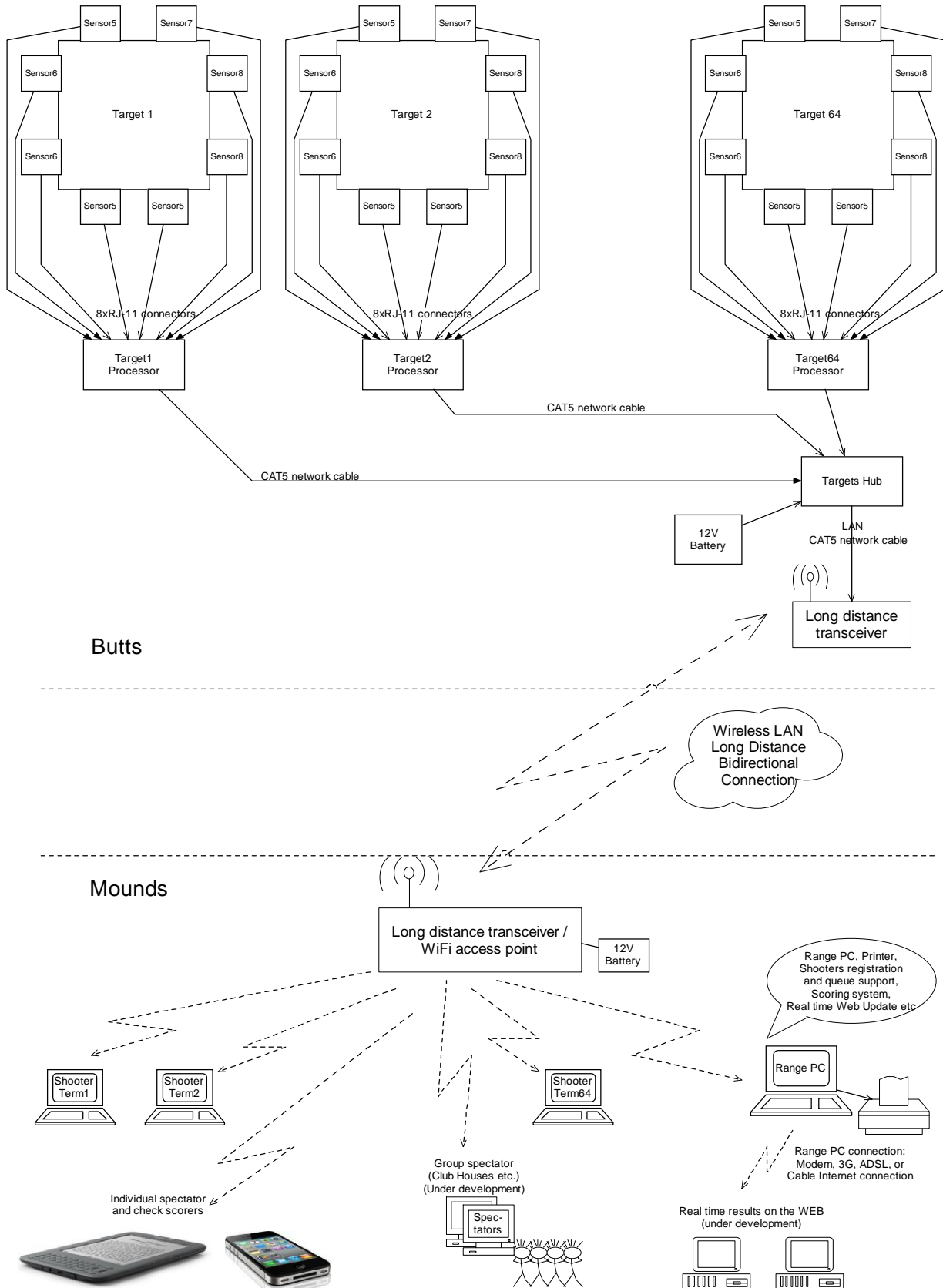
- Rubber sheets require periodic patching or replacement.
- Corflute material requires periodic inspection and repair/replacement.
- CAT5 cables and their RJ45 connectors, if damaged mechanically, may need to be fixed or replaced. (CAT5 network cables, RJ45 connectors and the crimping tools are widely available. Spare parts are not included in the HEXTA systems set, however can be purchased from HEX Systems separately).
- Batteries require charging and replacement. **Batteries are not covered by HEX Systems' warranty.** Manufacturer's warranty may be applicable.
- Shot sensors (HEXU-0000) require replacement.
- Shot wires require replacement or repair. (Wires are the ordinary telephone cables with RJ11 connectors, which are widely available. Spare wires and connectors are not included but can be purchased from HEX Systems separately).

Proper maintenance of the system will ensure long service life of the equipment and full enjoyment of the shooting sport.

Shooting Range HEXTA-001 structure

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Rev 0.03

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Sensor5	Sensor7
Sensor6	Sensor8
Target 1	
Sensor6	Sensor8
Sensor5	Sensor5

8xRJ-11 connectors

Target1 Processor

Target2 Processor

Target64 Processor

CAT5 network cable

CAT5 network cable

Targets Hub

12V Battery

LAN
CAT5 network cable

Long distance transceiver

Butts

Wireless LAN Long Distance Bidirectional Connection

Mounds

Long distance transceiver / WiFi access point

12V Battery

Range PC, Printer, Shooters registration and queue support, Scoring system, Real time Web Update etc

Shooter Term1

Shooter Term2

Shooter Term64

Range PC

Range PC connection: Modem, 3G, ADSL, or Cable Internet connection

Individual spectator and check scorers

Group spectator (Club Houses etc.) (Under development)

Spec-tators

Real time results on the WEB (under development)

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2 eTarget system HEXTA-001 components

The following components are currently used for HEXTA-001 system (see pictures below):
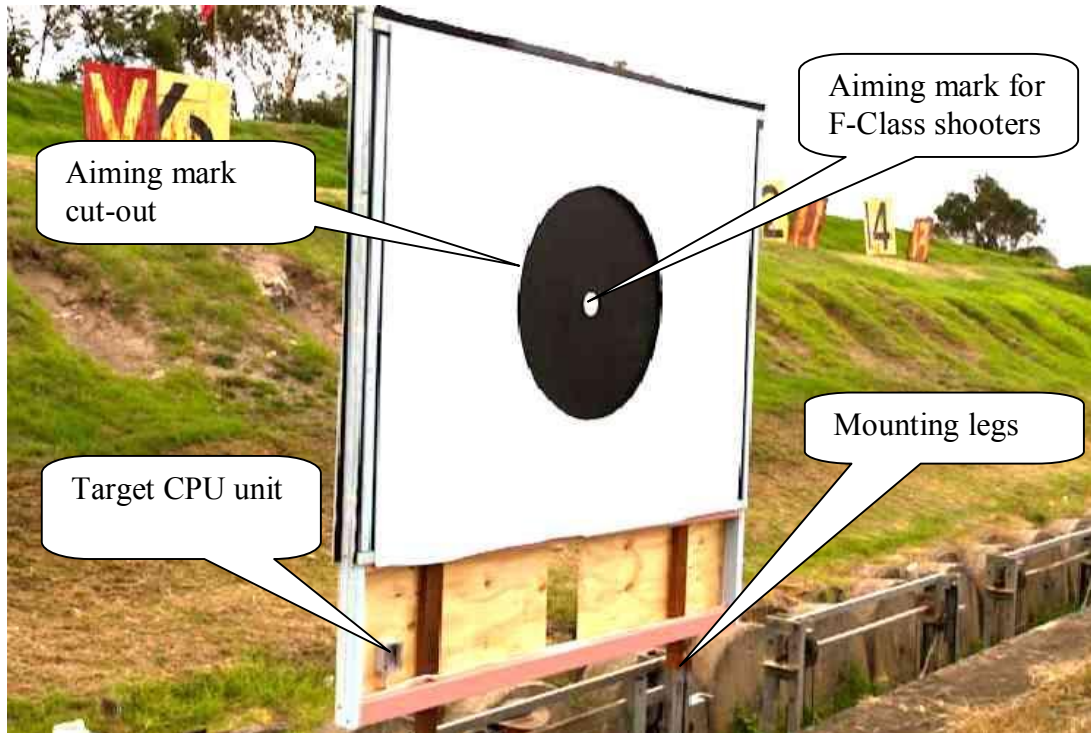

Figure 1 eTargte Frame HEXF-0800 assembled (include eight sensors and CPU module)

Figure 2 eTarget sensors HEXU-0000 with built-in active filters, analogue signal pre-processor
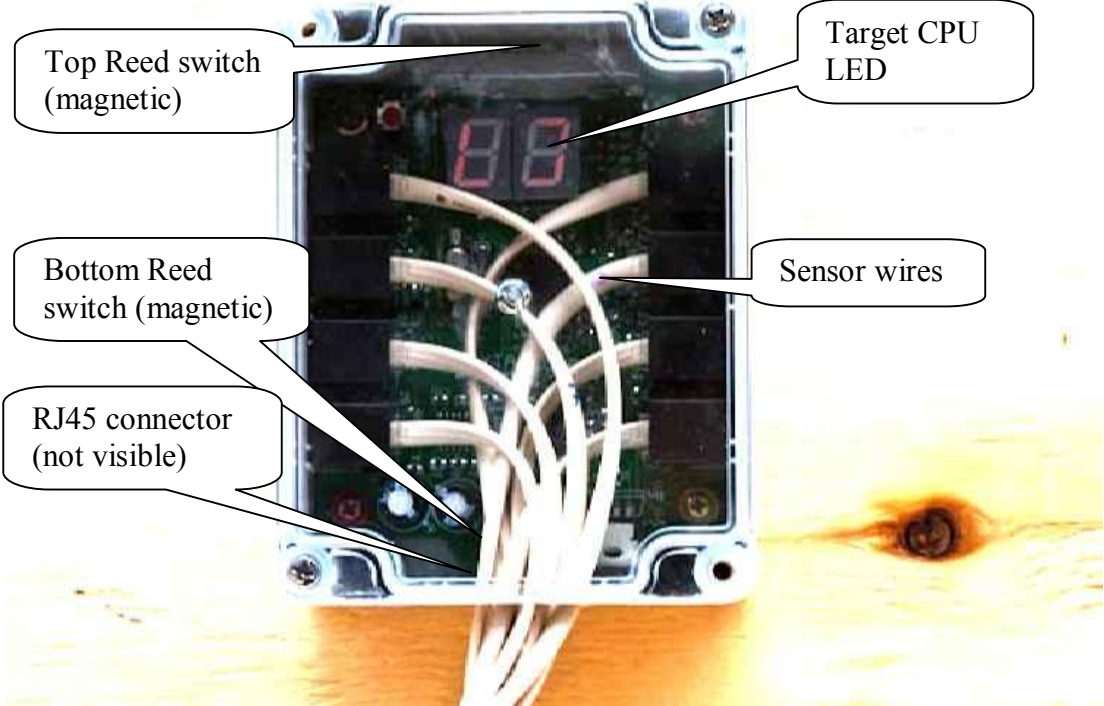
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Figure 3 eTaget CPU module HEXU-0001 (information LED is visible on the picture)
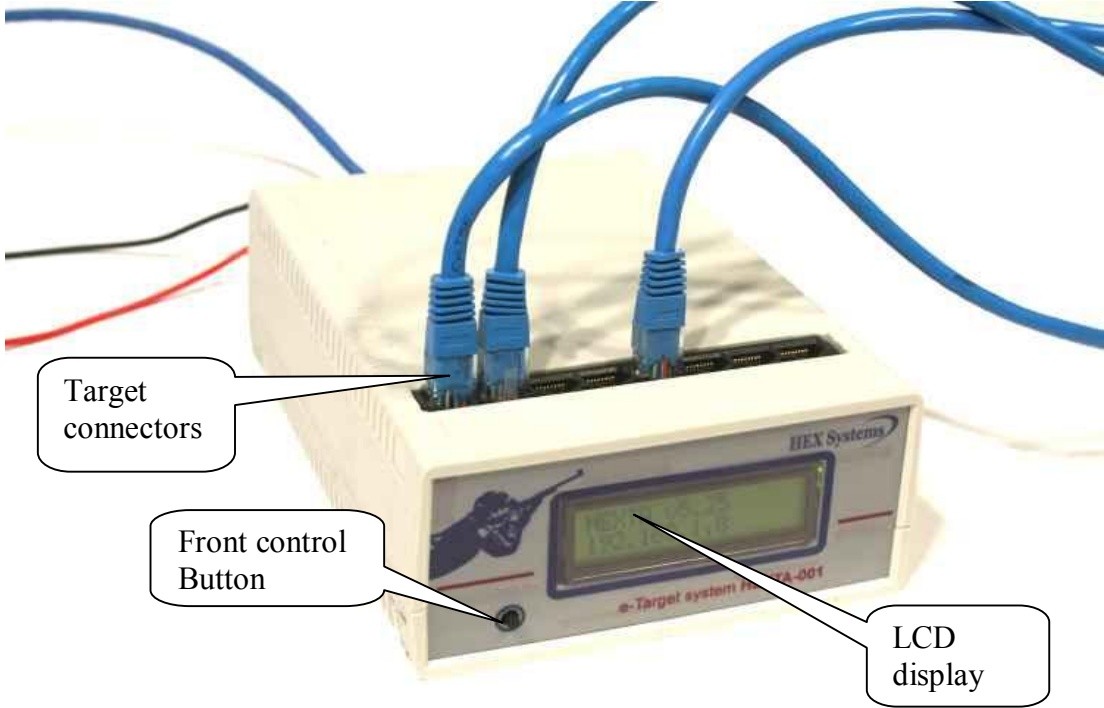
Figure 4 eTarget HUB HEXU-0002 (8-target model) with 3 target CAT5 cables connected.

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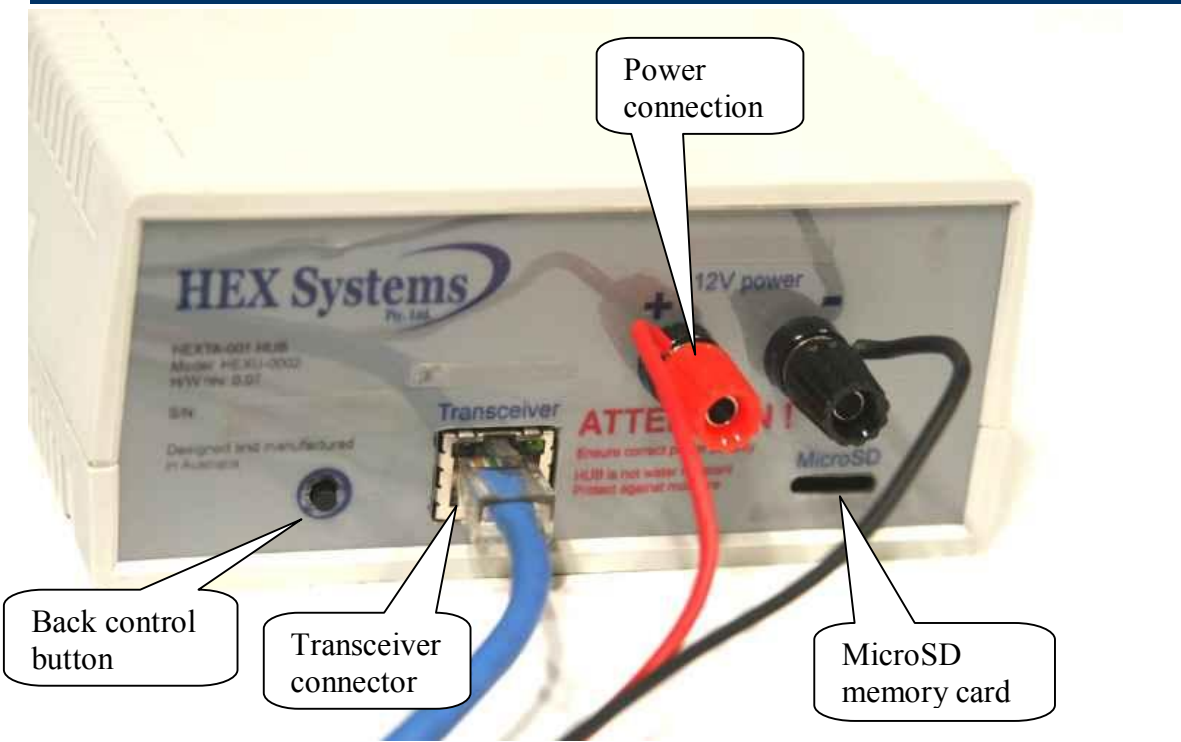

Figure 5 eTarget HUB HEXU-0002 (back panel) with transceiver CAT5 cable connected
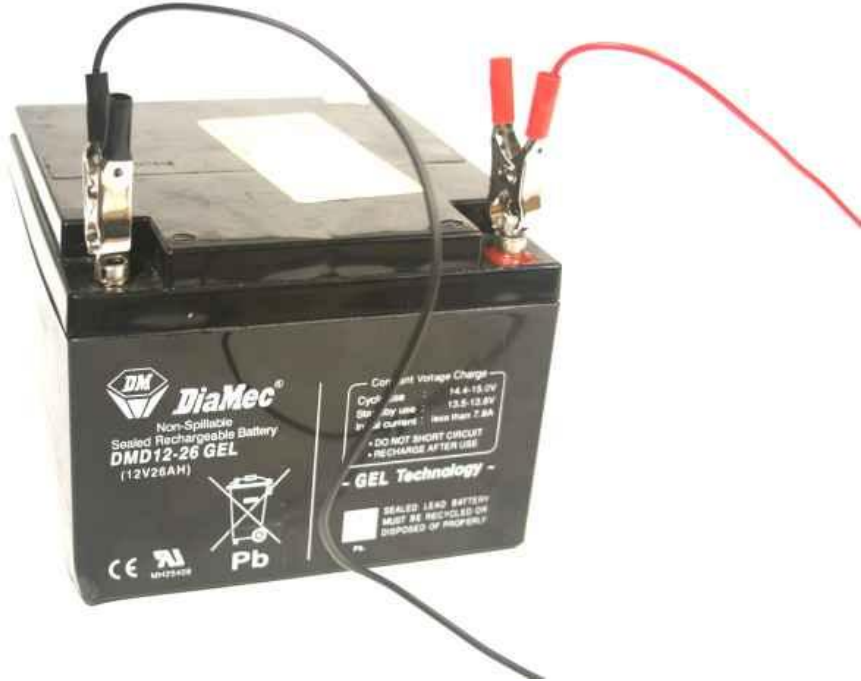

Figure 6 Battery HEXU-0008 to supply power to the HUB and eTargets
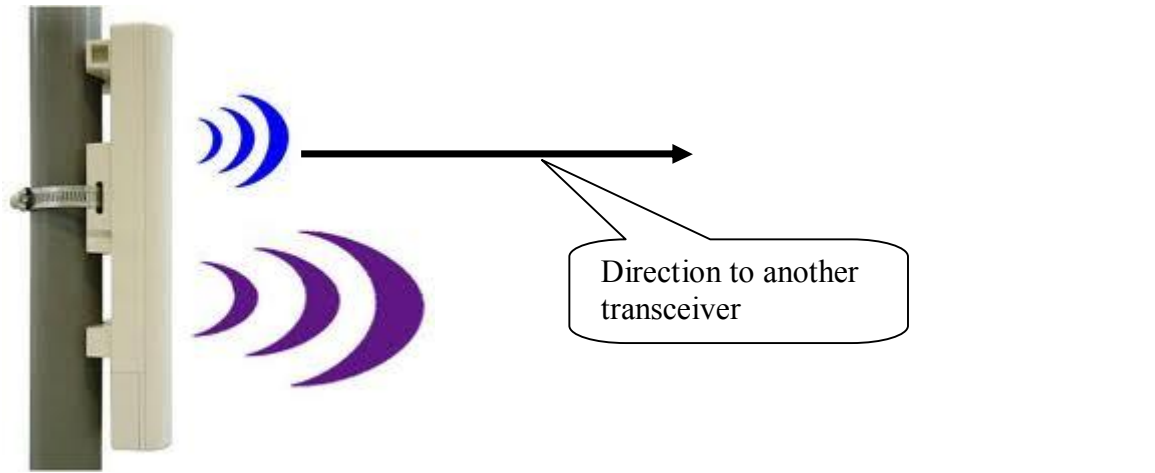
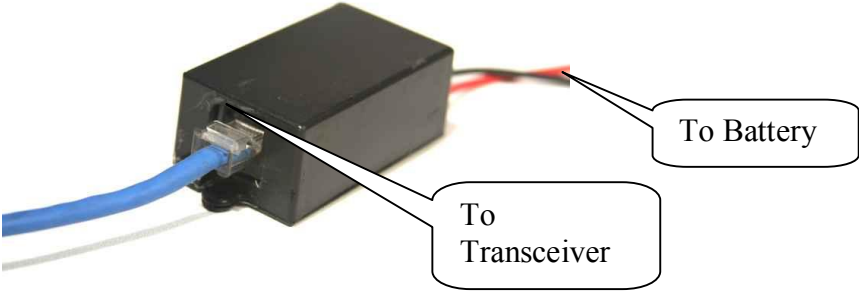**Figure 7 Transceivers HEXU-0010 and HEXU-0011 attached to the pole (CAT5 cable not shown)**

Figure 8 Power Injector HEXU-0004 for the mound transceiver

Figure 9 Shooting station HEXU-0005 (including Power Supply)

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Figure 10 Standard CAT5 cable (right) with RJ45 connectors (left)

2.1 Butts side

1. eTarget frame assembled HEXF-0800 (Figure 1) including eight mounted Sensors HEXU-0000 (Figure 2) and mounted and connected CPU module HEXU-0001 (Figure 3).
2. CAT-5 network cable with RJ45 connectors, Figure 10 (one per frame).
3. eTarget HUB HEXU-0002 (Figure 4 and Figure 5, one per range).
4. 12V 26aH battery HEXU-0008 (Figure 6, one per range).
5. Transceiver HEXU-0010 on an aluminum pole with a stake (Figure 7, one per range).
6. CAT-5 network cable with RJ45 connectors, Figure 10 to connect HUB and transceiver.

2.2 Mound side, re-transmitter

1. Transceiver HEXU-0011 on an aluminum pole (Figure 7, one per range) and a stake with CAT5 cable (Figure 10) attached.
2. 24V Transceiver Power injector HEXU-0004 (Figure 8) to supply the transceiver with power.
3. 12V 12aH battery HEXU-0003.

2.3 Mound side, Client station

1. Sun-readable monitor HEXU-0005 (Figure 9).
2. Additional high-capacity battery for monitor HEXU-0007.
3. Connection harness for additional battery HEXU-0009.

2.4 In-house maintenance equipment

1. Battery charger/maintenance unit HEXU-0013 (two items).
2. Shooting station Power Supply/Charger (Figure 9, one per station).

2.5 The tools

1. Hammer to install stakes to the ground (not supplied by HEX Systems, not required if the transceivers are mounted permanently)
2. Stake and pole to mount the transceiver (not supplied by HEX Systems)

3. Small magnet to test and setup the system.

3 Day-to-day installation instruction

Assuming that the system is already unpacked and installed, as described in paragraph 4 on page 13
The user may choose different deployment strategies, e.g. some devices could be mounted permanently. In this case, the user may skip the corresponding steps in the installation instructions in day-to-day installation of the system section.

3.1 *Systems installation in the butts*

1. Choose a location for the Transceiver HEXU-0010 in the butts away from the bullet trajectory and in the line of sight with the Transceiver on the mound.
2. Choose a location for the HUB HEXU-0002 and the battery HEXU-0008 (see paragraph 4.1.4).
3. Install eTarget frame with CPU unit in the frame holder.
4. The stake for the transceiver pole should be hammered into the ground.

   IMPORTANT!!! Ensure that the range is "closed" during installation of antenna and the Installer is safe.
5. If the Transceiver HEXU-0010 is not attached to the aluminum pole, attach it.
6. Connect RJ45 connector of Transceiver cable to the eTarget HUB HEXU-0002
7. Connect eTarget HUB HEXU-0002 to the battery HEXU-0008. The **BLACK** crocodile clip must be connected to the **negative** battery electrode. The **RED** crocodile clip must be connected to the **positive** battery electrode.
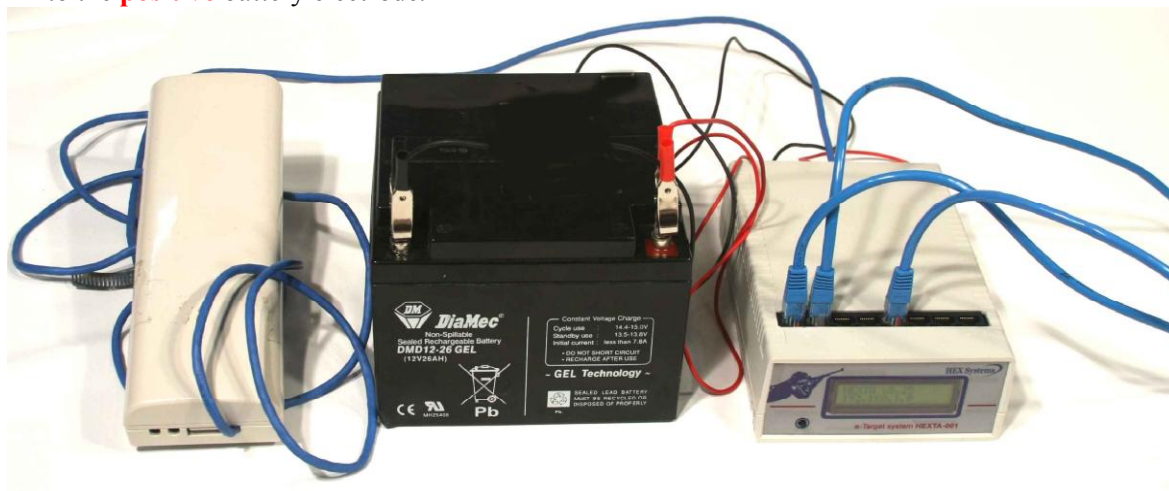

Figure 11 The butts system assembled (the frames HEXF-0800 not shown)

   IMPORTANT!!! Ensure that polarity of the battery and connections are correct. Incorrect connection leads to immediate damage of the HUB and voids the warranty.

8. Ensure that the green light on the back of the Transceiver HEXU-0010 is ON.
9. Ensure that the HUB's front panel LCD display shows proper information.
10. Ensure that the green light on the RJ45 connector on the back of the HUB is ON (green) and the yellow light is blinking.
11. Secure Transceiver CAT5 cable around the pole.
12. Attach aluminum pole with the transceiver to the stake on the top of the butts and secure it so that it does not rotate. The transceivers should face each other and no obstacles should be between them especially on the long ranges.
13. Connect each target HEXU-0800 to the RJ45 connector on the top of the HUB.

14. Check each target LCD to ensure it shows the correct (predefined) **unique** number of the target and the decimal dot on the right bottom corner of the LEDs is blinking. (For changing the number see paragraph 4.2.1). This unique number will be used on the monitor on the mound to determine which target's information it must display.
15. The butts installation is finished.

3.2 System Installation on the Mound

1. The stake should be hammered into the ground in the center as close as possible to the shooting line (to the shooters monitors).
2. Connect RJ45 connector from the end of CAT5 transceiver cable to Power Injector HEXU-0004
3. Connect power injector to the battery HEXU-0003. The **BLACK** crocodile clip must be connected to the **negative** battery electrode. The **RED** crocodile clip must be connected to the **positive** battery electrode.
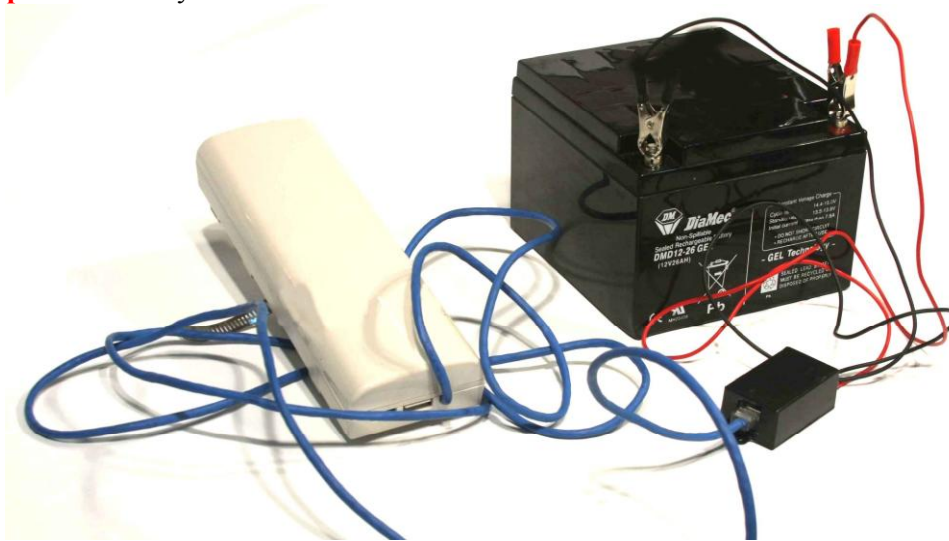

Figure 12 Mound Transceiver (HEXU-0011) connection to the Power injector (HEXU-0004) and the battery HEXU-0003 (battery on the picture HEXU-0008 is different from HEXU-0003, however HEXU-0008 can be used as well)

IMPORTANT!!! Ensure that polarity of the battery and connections are correct. Incorrect connection leads to immediate damage of Power Injector and voids the warranty.

4. Ensure that the green light on the back of the Transceiver is ON.
5. If Transceiver HEXU-0011 is not attached to the aluminum pole, attach it.
6. Secure the Transceiver's CAT5 cable around the pole.
7. Attach the aluminum pole to the stake and secure it so that it does not rotate. The transceivers should face each others and no obstacles should be between them, especially on the long ranges.

3.3 Monitor configuration on the Mound

The transceivers should be switched on first. The monitors should be switched on about 3 minutes after the transceivers, as they need establish communication between themselves first.

1. After 3 minutes when butts and mound are configured and switched ON, switch the monitor ON by pressing and holding the power button for 1 sec (see Figure 9).
2. Wait until the initial screen comes up.
3. Select the target number (which corresponds to the target number on the target CPU, see paragraph 4.2.1 CPU setup).

4. Select the default options for your range and shooting event (distance, number of shots, number of sighters, etc). The number of shots and number or sighters can be adjusted for each user later on. This is just the default parameters for all users.
5. Press OK.
6. Make sure that the monitor shows CONNECTED sign. The system is now ready.

You may connect more than one monitor to each target. They can be used by the check scorer or spectators. Additional monitors are configured exactly the same way as the shooter station. A fully charged internal monitor's battery lasts for about 3 hours. You may connect an additional battery to the monitor HEXU-0007 with harness HEXU-0009. Ensure that the monitor is powered from the external power (the power indicator (see Figure 9) on the monitor is yellow or green when external power is connected). In this case the total run time of the monitor will be about 8 hours.

4 First time installation instruction

The systems or some components of the systems can be installed permanently. Make sure that the Environmental recommendations (paragraph 4.1) for the installation of each component are strictly followed.

4.1 Environment susceptibility and recommendations

Although the components are water/splash- and environment- protected, we recommend taking extra precautions against rain and direct sun exposure whenever possible.
The devices which are claimed as splash-protected are not water resistant. Meaning they are protected only against water splash and light rain. **Heavy rain and submerging in water can cause permanent non-repairable damage, which is not covered by the warranty.**

All devices should be protected against bullets. **Physical damage of any device is not covered by the warranty.**

The product is electrically safe, as it does not have voltage above 24V. The exception is the Battery Charger/Maintenance unit HEXU-0013, which is supplied with external electrical power. For HEXU-0013 see provided User Instruction.

4.1.1 Frames HEXF-0800

Target frames can be installed permanently. Although the frame electronics (including Sensors HEXU-0000 and the Target CPU HEXU-0001) are splash-protected, the frames are made from timber which is susceptible to rain and moisture. Rubber and confute materials are susceptible to direct sunlight. When not in use protect target frames from direct sunlight and from rain/moisture.

IMPORTANT!!!

- **Frames are heavy. Please ensure that you are properly equipped to lift or move or the frames.**

- **Secure frame properly by the target legs to a solid base. It is the user's responsibility to secure the target properly.**

4.1.2 Transceivers HEXU-0010 and HEXU-0011

Transceivers and cabling can be mounted permanently. Although the transceivers are made from ultraviolet resistive plastic and are splash resistive; it is recommended that an additional (disposable and/or replaceable) protection from rain and direct sun light be used (i.e. under cover – "umbrella", etc.). **Do not use metal materials around the transceivers for protection.**
The transceivers should face each others and no obstacles should be between them, especially on the long ranges.

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4.1.3 Cables

The system uses widely available network CAT5 cables with standard RJ45 connectors. The cables are splash-resistive. However, you should protect the cables from direct sunlight when possible. The RJ45 connectors must be protected from moisture and direct sunlight when not is use.

4.1.4 eTarget HUB HEXU-0002

IMPORTANT!!! The HUB is NOT splash-protected. Ensure that the HUB location is protected from rain. Water can cause permanent non-repairable damage to the HUB, which is not covered by the warranty.

4.1.5 Batteries HEXU-0003, HEXU-0007, HEXU-0008

The batteries are water-protected, but not sun-protected. Keep them in a shade. In case of rain wipe out any water around contacts to prevent the electrolytic oxidation of the contacts.

IMPORTANT!!!
- **NEVER short the contacts of the battery.**
- **Double check the connection of the devices and the chargers to the batteries.**
- **When transporting, ensure that there are not loose metals around that can short the contacts.**
- **Never leave the battery connected to the system when system is not in use.**
- **Do NOT discharge and leave the battery fully empty.**
- **Do not disassemble the battery.**
- **Dispose of the battery according to the local chemical goods disposal regulations.**
- **Use only supplied charger to charge the battery.**
- **Connect to the battery ONLY the devices specified in this document.**

Not following these instructions may cause damage to the battery or equipment not covered by manufacturer warranty. It can also cause damage to other equipment, buildings and animals, can cause injuries to people and even death.

The batteries are water-protected, but not sun-protected. Keep them in a shade. In case of rain wipe out any water around contacts to prevent the electrolytic oxidation of the contacts.

4.1.6 Power Injector HEXU-0003

The Power Injector is splash protected and supplied with an attached 3-meter CAT 5 cable. However, the Power Injector has metal battery clips which are susceptible to corrosion. If the clips get wet, clean and allow them to dry as soon as possible.

IMPORTANT!!! Do not leave the Power Injector connected to the batteries. Disconnect and clean the clips immediately after using the system.

4.1.7 Sun-readable monitor HEXU-0005

The monitor is designed as splash-protected. However we strongly recommend protecting the monitor from any drizzle, rain, moisture. Clean monitor up from any moisture as soon as possible and allow the monitor to dry.

4.1.8 Harness for additional battery HEXU-0009

The harness is splash-protected. However it contains metal parts, which are susceptible to corrosion. If affected by moisture clean the harnesses as soon as possible and allow them to dry.

IMPORTANT!!! Do not leave harnesses connected to batteries or/and monitors. Disconnect and clean them immediately when you finished using them.

4.1.9 Battery charger/maintenance unit HEXU-0013

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The Battery Charger/Maintenance unit HEXU-0013 is meant to be used only in-house for batteries charging/maintenance. The unit is supplied with external electrical power. For HEXU-0013 see Charger User Instruction.

4.2 *First installation and system configuration*

During the first installation it is necessary to assign a unique number for each target, which are used simultaneously. This number will be used as the reference in the shooter stations monitor. The target frame number is displayed by Frame CPU LEDs after the target is connected to power until the first shot fired or shot simulation is performed.

4.2.1 To assign the target frame number

1. Use the magnet (page 3, paragraph 2.5, item 3).
2. Place and hold the magnet on the top of CPU box (see Figure 3) until the number starts incrementing. When the required number is displayed remove the magnet. CPU will remember the number.
3. Disconnect the target (using Target CPU box RJ45 connector).
4. After 10 seconds restore the connection.
5. Check that the number displayed on LED is the required number.

4.2.2 To simulate the shot from the target side

1. Use the magnet (page 3, paragraph 2.5, item 3).
2. Briefly touch the top of the Target CPU box with the magnet.
3. The Target transmits the simulated shot. LEDs show "[ ]" sign as during a real shot (see Figure 3).

4.2.3 To check if the sensors are correctly operating during shooting

Each shot when detected will be displayed on the Target CPUs LEDs as "[ ]" sign (see Figure 3). Each segment of this sign corresponds with the sensor with the similar location. If the segment does not light up - the sensor did not receive the signal. For example at Figure 3 the top left segment is missing. This indicates that the top left sensor did not detect the shot.

After 5 seconds the sign will blink and then it turns OFF, however the target would be ready to accept the shot approximately within 50mS after the shot is received

4.2.4 Communication verification

When communication is established with the mound transceiver, the decimal point on the right LED section flashes 1 sec ON ad 3 sec OFF. If connection is established with the user terminal the decimal point on the right LED section blinks 0.5 sec ON and 0.5sec OFF.

The system has also another level of communication verification which is used on the shooters' end. This verification is described in the shooter's monitor description document.

4.2.5 Aiming marks

The front corflute has a hole cut in the center (see Figure 1), which defines the larger aiming mark normally for the above 700m ranges (1120mm diameter). When the frame is used on other ranges where the smaller size aiming mark is required special face with the smaller aiming mark should be installed on the top of Frame front corflute with the pieces of adhesive Velcro tape. Mark the faces location and target number so you will be able to place the face to the same place all the time

4.2.6 Aiming center for F-Class shooters

It is possible to cut and to glue with soft adhesive the piece of corflute to the center of the aiming mark to the rubber membrane so the F-Class shooters can use this mark for aiming (see Figure 1).

1