

**Badger®-Radix®
Data Collector**

**Cascade Loader-Charger
System**

**Installation &
Operation Manual**



Badger®-Radix® Data Collector Cascade Loader-Charger System

INTRODUCTION

For ease of use, Badger Meter provides a Cascade Loader-Charger system that can simultaneously communicate and charge the Badger-Radix Data Collector solution. The Cascade provides utilities with the flexibility to connect up to twelve Badger-Radix units to the CONNECT™ computer through a single serial port.

Utilizing the infrared port on the handhelds, the optical Cascade Loader-Chargers system offers high-speed communication through the unique optical light guide feature (patent pending). This ensures that the loading and unloading of data between the handheld and the host computer is fast and reliable.

Each Cascade Loader-Charger System is comprised of a Cascade Console and up to four (3) bay loader-chargers. This provides utilities with a flexible solution to maintain and communicate with up to twelve Badger-Radix Data Collectors. Data transfer from the computer to the three bay loader chargers is completed using FTP protocol.

The Badger-Radix Data Collector performs battery management automatically while it is docked in the loader-charger assemblies. The circuitry of the handheld ensures long data collector battery life from its powerful lithium battery. If the battery is fully discharged, the Cascade Loader-Charger will completely re-charge the Badger-Radix Data Collector within 2 to 3 hours.

Communication between the computer and the Cascade Loader-Charger incorporates FTP protocol via serial port communication. Communication between the loader-charger and the Badger-Radix Data Collector is via Optical Infrared (IR). This port does not require physically contact and ensures environmental integrity of the Badger-Radix Data Collector. Data communication operates at 115K baud allowing rapid data transfer to and from the handheld.

Figure 1



Figure 1 shows the Cascade Console with four 3 bay loader-chargers. The features of the Cascade Loader-Charger System include:

- Ease of use – drop in data transfer and battery charging
- Multi-function – high speed data transfer and charging occur simultaneously
- Modular design – for versatility
- Ergonomic design – for practical use

For compatibility with existing Radix handhelds and loader-charger equipment, consult your Radix User Guide.

Installation and Operation

After you unpack the components of the Cascade Loader-Charger modular system, check that all of the parts are present and that they show no signs of damage. The following equipment should be supplied for each modular component purchased:

- One Cascade Console
- Up to four 3 bay loader-chargers
- An interface cable to connect the Cascade Console to the host computer
- An AC power supply for the Cascade Console

Contact your supplier if you experience any problems with equipment. Do not connect the system to the main electrical supply or to a host computer or network if you suspect any part is damaged.

Observe the following recommendations when you select a location for the Cascade Loader-Charger System.

- Select location close to a suitable electrical power supply and host computer for data transfer.
- Avoid installations where the temperature might exceed 41°F to 105°F or where humidity can affect the electronics. Do not install the Cascade Console system where it will be affected by the direct heat from sources such as radiators, heat vents, lamps or direct sun light.
- Avoid installations in area of high concentrations of dust, dirt or smoke.
- Avoid locations that are subject to powerful alternating or static magnetic fields. Do not install the equipment near radio transmitters, loudspeakers, air conditioners, fans and electric motors.

ASSEMBLY AND CONNECTION

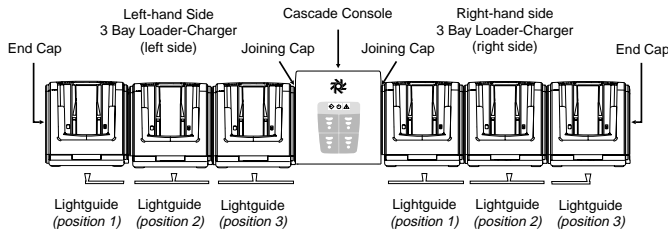
You can attach up to 3 Bay Loader-Chargers to each multiway console. Each extension arm includes cradles to hold up to three handheld computers.

By default the extension arms are supplied configured to attach to the right-hand side of the multiway console. If you

intend to connect an extension arm to the left-hand side of the multiway console, you must reverse the end cap and the light guides—follow the procedure described below.

If you intend to fit extension arms only to the right-hand side of the Cascade Console, ignore the assembly instructions provided for left-hand extension arm.

Figure 2: Connecting components of the Cascade Console



LEFT-HAND EXTENSION ARM

⚠ WARNING

If you are modifying a Cascade Console that is already in service, disconnect the power supply and communications interface cable before you continue with the following procedure.

1. Remove and retain the two screws that secure the end cap at the right-hand end of the extension arm. Remove and retain this end cap.
2. Invert the extension arm and locate the lightguide channels in the base of the module.
3. Carefully remove the lightguides from positions 1, 2 and 3. Do not scratch or damage them during this procedure. Note that each lightguide has a unique part number corresponding to its relative installed location in the extension arm. Make sure that you re-install the lightguides in their correct relative position in the extension arm.
4. Rotate the lightguide that you removed from position 1 through 180° and refit it into the empty channel at position 3.
5. Rotate the lightguide that you removed from position 2 through 180° and refit it into the empty channel at position 2.
6. Rotate the lightguide that you removed from position 3 through 180° and refit it into the empty channel at position 1.

NOTE: With all three lightguides re-installed in the base of the extension arm there should be a continuous light path from position 1 through to position 3.

7. Turn the extension arm the correct way up and follow the instructions below, beginning at step 3, to fit it to the left-hand side of the multiway console. See the note immediately below.

ASSEMBLING THE CASCADE CONSOLE

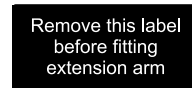
NOTE: For security and reliability Radix recommends that you use a mounting bracket, see mounting bracket figure below, to fasten the outermost loader/charger cradle of each extension arm to the supporting surface. The horizontal section of the bracket is usually located beneath the loader/charger cradle. For this reason you should first find the correct position for each bracket and then secure it to the supporting surface with two #4 screws of diameter 0.112 inch (3 mm).

Mounting bracket



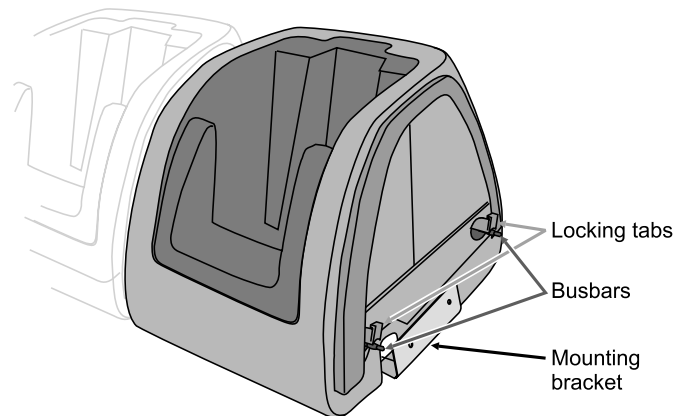
1. Before you attach the 3 Bay Loader-Charger extension arms to the Cascade Console, ensure that the lightguides are installed securely and that they form a continuous light path. Refer to the instructions for left-hand extension arm for more details.
2. Remove and retain the two screws that secure the end cap to the extension arm. Remove and retain this end cap.
3. If fitted, remove and discard the self-adhesive light exclusion label from each infrared port of the Cascade Console to which an extension arm is to be fitted. The light exclusion label is shown in Figure 3.

Figure 3: Light exclusion label



4. Pull back the extension arm locking tabs and the busbars until they are fully extended as shown in Figure 4.

Figure 4: Busbars and locking tabs shown fully extended



5. Twist each locking tab to keep the busbars in the fully extended position as shown in Figure 5.

Figure 5: Locking tab activated



6. Lift the inner end of the extension arm and slide it over the joining cap on the Cascade Console. Gently push it all the way down onto the joining cap until it is level with the base of the Cascade Console, see Figure 6.

Figure 6: Fitting the 3 Bay Loader-Charger to the Cascade Console



7. Twist the two locking tabs back to their normal position as shown in Figure 7.

Figure 7: Locking tabs in normal position



8. Push the two busbars into the extension arm until they lock with the Cascade Console. Push in the locking tabs.

9. If you are using a mounting bracket, secure the outermost loader/charger segment to the vertical part of the bracket using two 3 mm screws.

10. Position the end cap on the extension arm by offering it to the loader/ charger at base level and sliding it upwards. Secure it in position with two screws.

11. Repeat steps 1 to 10 for any additional extension arms that you intend to add to the Cascade Console.

LIGHT EXCLUSION LABELS

New Cascade Console units

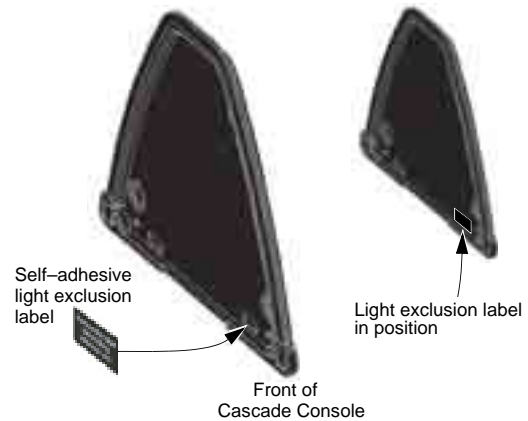
Each new Cascade Console is supplied with a light exclusion label covering the infrared port of each of the four extension arm positions.

The light exclusion label must be removed from each infrared port of the Cascade Console corresponding to the position to which an extension arm is to be fitted. Refer to step 3 of the Assembling the Cascade Console procedure.

Existing Cascade Console Units

If the Cascade Console does not have a light exclusion label at vacant extension arm positions it is recommended that a label is fitted to each of these positions, as follows:

Figure 8: Fitting light exclusion labels



1. Remove the protective backing from the self-adhesive light exclusion label.

2. Position the light exclusion label to cover the infrared port and press into place.

NOTE: The infrared port is towards the front of the Cascade Console in each extension arm location.

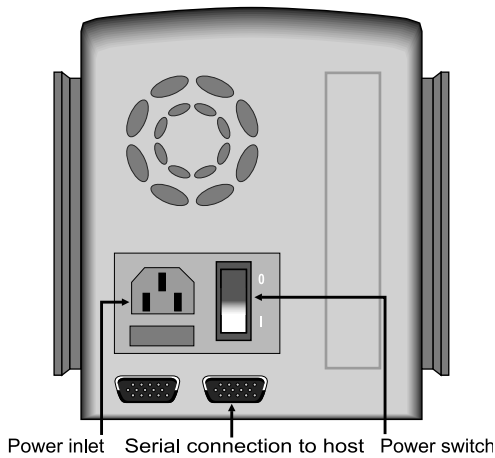
3. Fit a light exclusion label to each vacant 3 Bay Loader-Charger position.

NOTE: If further extension arms are added at a later date the light exclusion label must be removed from each arm

position before the new arm is fitted. Refer to page 11 for details of fitting extension arms.

CONNECTING CABLES

Figure 9: Cascade Console rear panel



CAUTION

Power-off the host computer before you connect any communication cables to it from the Cascade Console system.

WARNING

Connect SELV (safety extra-low voltage, that is less than 42.4 V peak AC or 60 VDC) circuits on this equipment only to other circuits that comply with the requirements of SELV circuits as defined in IEC 950, EN 60950, CSA C22.2 number 950 and UL 1950.

WARNING

Where the Cascade Console system includes a mains cable that has free ends, it is the responsibility of the engineer who installs the equipment to fit a connector that meets the safety requirements of the region where the equipment will be used, and to connect the individual cores to the correct terminals.

1. Power-off the host computer (for local connection) or the modem (for remote connection) before you connect the communication cable to the Cascade Console, as detailed below.
2. For local connection only – connect the data transfer cable from the host computer communications port to the
3. 15-way D-type port on the rear panel of the Cascade Console with the following cable:

Loader-Charger - establishing an initial connection - Windows 2000

1 Introduction

This technical bulletin details the Windows 2000 procedure for making an initial connection between a host PC and the Loader-Charger (LC).

2 Adding a PC to LC connection

A connection between the host computer and the LC must be established to enable the LC current defaults to be displayed and to allow any required program changes to be made to its non-volatile memory.

1. At the host PC Control Panel double-click **Phone and Modem Options**.



Phone and Modem Options

2. The following screen is displayed:



Click the **Modems** tab.

3. The following screen is displayed:



Click **Add**.

4. The following screen is displayed:

Tick **Don't detect my modem; I will select it from a list** check box.



Click **Next**.

5. The following screen is displayed:



In the **Manufacturers** box, select **Standard Modem Types**.

In the **Models** box, select **Communications cable between two computers**.

Click **Next**.

6. The following screen is displayed:



Select the **Selected ports** option.

Select **COM1** or **COM2** as appropriate for your system

Click **Next**.

7. The following screen is displayed:



Click **Finish**.

The modem is now installed. Proceed to the next step to set up the new connection.

3 Setting up the new connection

8. At the host PC Control Panel double-click **Network Connections**.



Network and Dial-up Connections

9. The following screen is displayed:



Double Click **Make a New Connection**.

10. The following screen is displayed:



Click **Next**.

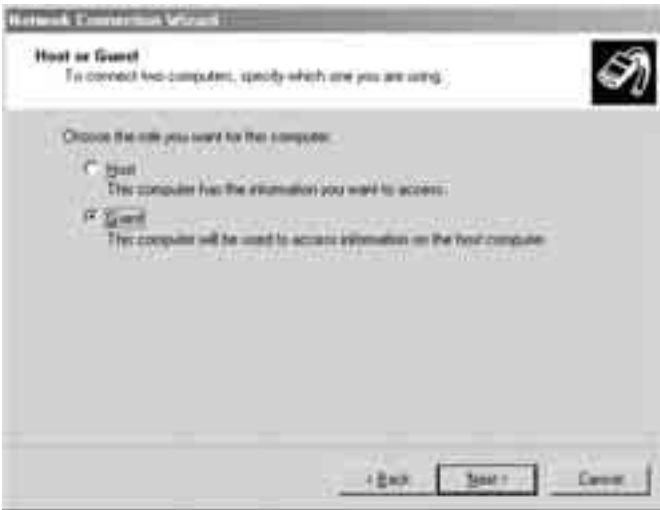
11. The following screen is displayed:



Select **Connect directly to another computer**.

Click **Next**.

12. The following screen is displayed:



Select **Guest**.

Click **Next**.

13. The following screen is displayed:



Ensure **Communications cable between two computers** is displayed in the **Select a device** box.

Click **Next**.

14. The following screen is displayed:



This screen gives the option of allowing **For all users** or **Only for myself**.

Select the connection option required.

Click **Next**.

15. The following screen is displayed:

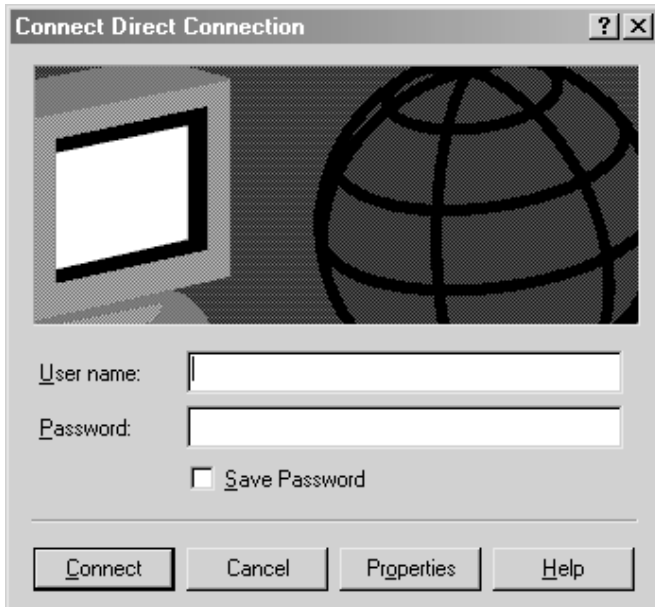


Enter **Direct Connection** as the name for this connection.

Click **Finish**.

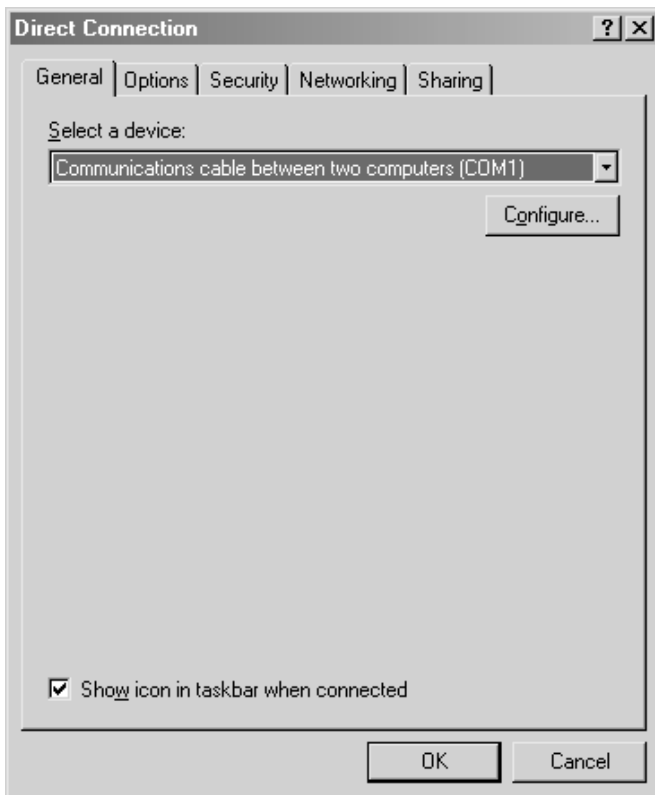
4 Configuring the connection

16. The following screen is displayed:



Click **Properties**.

17. The following screen is displayed:



Click **Configure**.

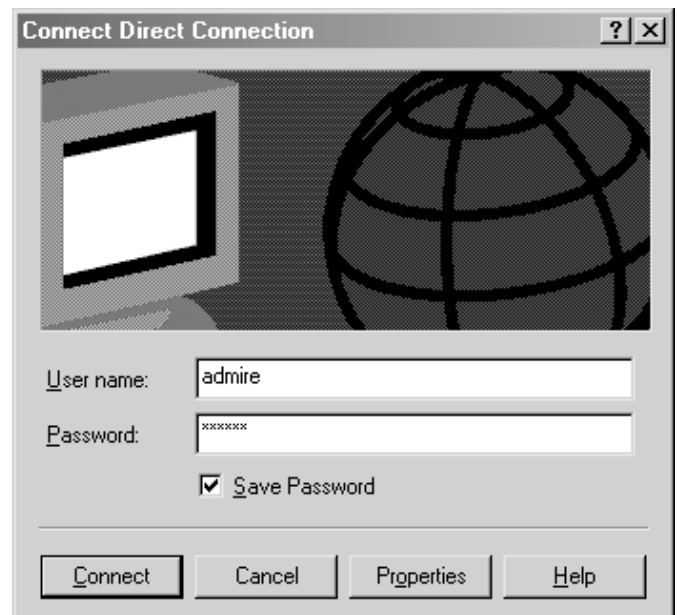
18. The following screen is displayed:



Set **Maximum speed (bps)** to **115200** and click **OK**.

Click **OK** on the **Direct Connection Properties** screen to return to the **Connect Direct Connection** screen.

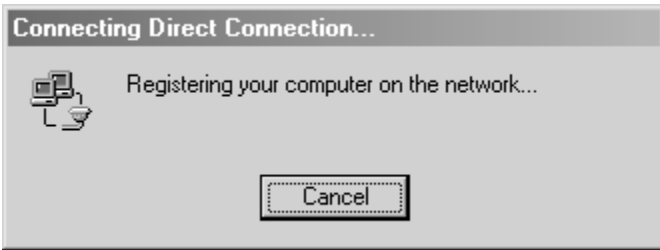
19. At the **Connect Direct Connection** screen, enter **admire** for both **User name** and **Password**.



Tick the **Save Password** check box.

Click **Connect**.

20. While the connection is being established the following message will be displayed:



21. On successful verification of user name and password the above message will be cleared and a connection confirmation message will be displayed:



Connection between the host computer and the handheld computer is now established. Communication between the host computer and the handheld can now be carried out.

Loader-Charger - establishing an initial connection - Windows XP

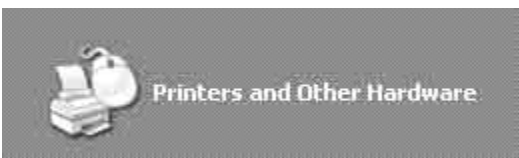
1 Introduction

This technical bulletin details the Windows XP procedure for making an initial connection between a host PC and the Loader-Charger (LC).

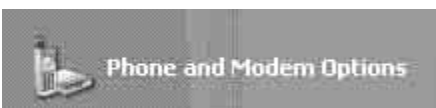
2 Adding a PC to LC connection

A connection between the host computer and the LC must be established to enable the LC current defaults to be displayed and to allow any required program changes to be made to its non-volatile memory.

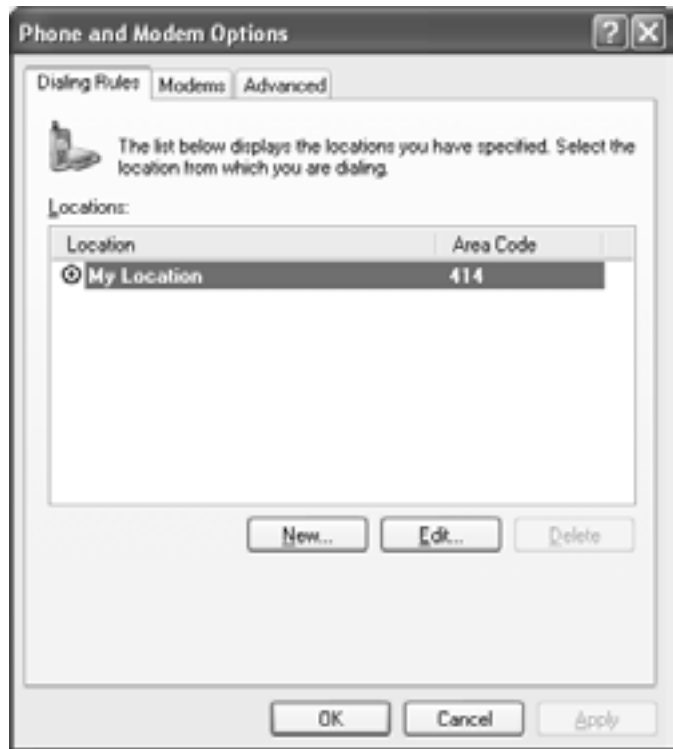
1. At the host PC Control Panel select **Printers and Other Hardware**.



2. From the **Printers and Other Hardware** screen, select **Phone and Modem Options**.



3. The following screen is displayed:



Click the **Modems** tab.

4. The following screen is displayed:



Click **Add**.

5. The following screen is displayed:

Check the box **Don't detect my modem; I will select it from a list** check box.



Click **Next**.

6. The following screen is displayed:



In the **Manufacturer** box, select **Standard Modem Types**.

In the **Models** box, select **Communications cable between two computers**.

Click **Next**.

7. The following screen is displayed:



Select the **Selected ports** option.

Select **COM1** or **COM2** as appropriate for your system

Click **Next**.

8. The following screen is displayed:



Click **Finish**.

Click **OK** on the **Phone and Modem Options** screen

Click **Close** on the **Printers and Other Hardware** screen

The modem is now installed. Proceed to the next step to set up the new connection.

3 Setting up the new connection

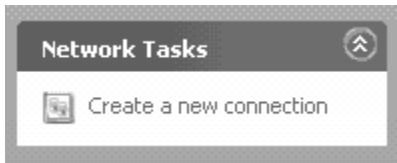
9. At the host PC Control Panel select **Network and Internet Connections**.



10. From the **Network and Internet Connections** screen, select **Network Connections**.



11. From the **Network Connections** screen, select **Create a new connection**.



12. The following screen is displayed:



Click **Next**.

13. The following screen is displayed:



Select **Set up an advanced connection**.

Click **Next**.

14. The following screen is displayed:



Select **Connect directly to another computer**.

Click **Next**.

15. The following screen is displayed:



Select **Guest**.

Click **Next**.

16. The following screen is displayed:



Enter **Direct Connection** as the name for this connection.

Click **Next**.

17. The following screen is displayed:



Ensure **Communications cable between two computers** is displayed in the **Select a device** box.

Click **Next**.

18. The following screen is displayed:



This screen gives the option of allowing for **Anyone's use** or **My use only**.

Select the option required.

Click **Next**.

19. The following screen is displayed:

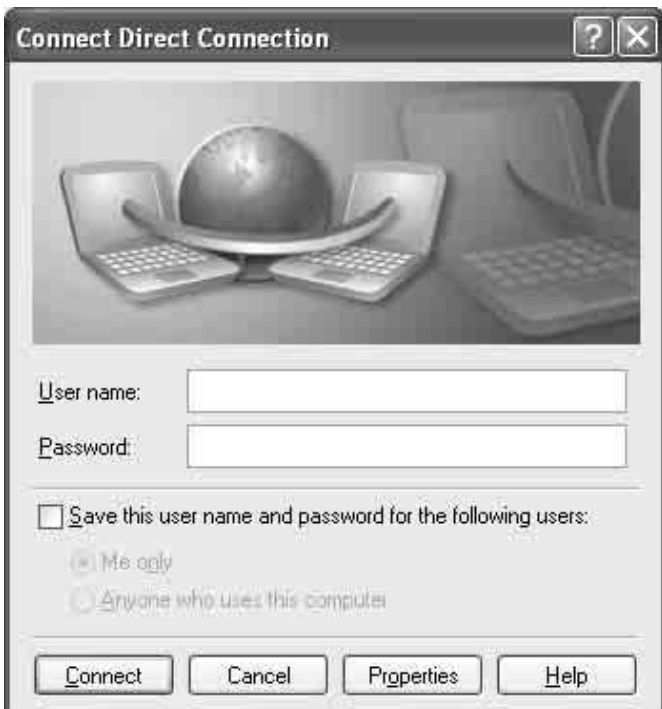


Select **Add a shortcut to this connection to my desktop** if required.

Click **Finish**.

4 Configuring the connection

20. The following screen is displayed:



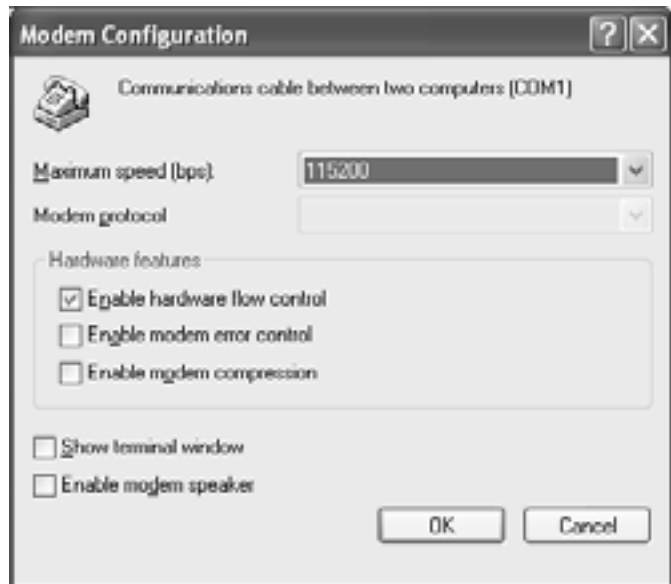
Click **Properties**.

21. The following screen is displayed:



Click **Configure**.

22. The following screen is displayed:



Set **Maximum speed (bps)** to **115200** and click **OK**.

Click **OK** on the **Direct Connection Properties** screen.

23. The following screen should be displayed.



Enter **admire** for both **User name** and **Password**.

Check the box **Save this user name and password for the following users** check box.

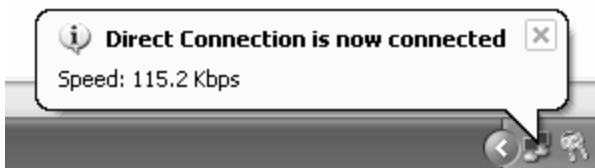
Select **Me only** or **Anyone who uses this computer** as required.

Click **Connect**.

24. While the connection is being established the following message will be displayed:



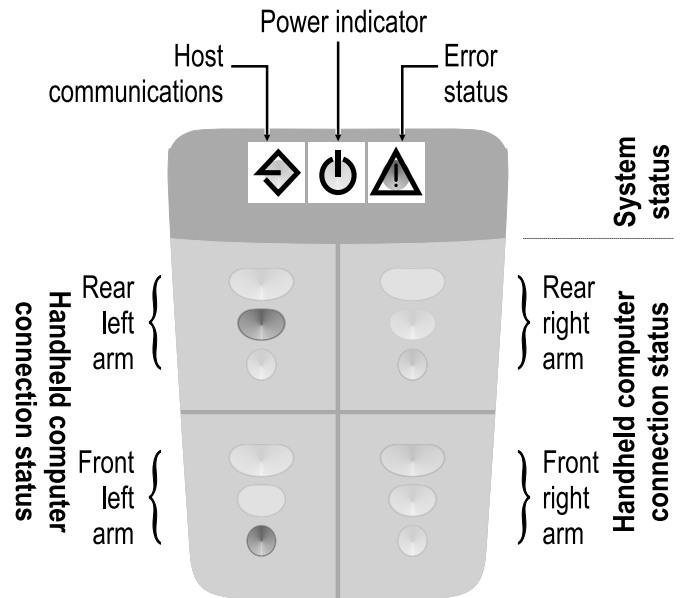
25. On successful verification of user name and password the above message will be cleared and a connection confirmation message will be displayed at the bottom of the host computer screen:



Connection between the host computer and the handheld computer is now established. Communication between the host computer and the handheld can now be carried out.

FRONT PANEL LED INDICATORS

Figure 1: Cascade Console LED indicators



Within each arm there is no fixed relationship between any light and any particular cradle of an extension arm.

CASCADE CONSOLE LED FUNCTIONS AND SEQUENCES

System status LEDs

The system status LEDs display colors according to the status of the system at any particular time.

The Host communications LED (top left) display is as follows:

- OFF - No connection to host.
- Flashing green - Connection in progress of being established.
- Constant green - Full connection in place between handheld and host.
- Flashing amber - Data transfer in progress.

The Power indicator LED (top center) shows Red to indicate that power is supplied to the Cascade Console.

The Error status LED (top right) is normally off. If this LED shows Red, at least one communications error or timeout has occurred and the Cascade Console has reset itself internally and is now operating normally. The presence of this red light does not indicate the Cascade

Console is faulty. Turn the Cascade Console off and on to extinguish the LED.

Table 1 shows the different display colors of the Host communications LED and the corresponding meanings.

Table 1: Host communications LED

<u>Action/Indication:</u>	Host communications <u>LED:</u>
Start-up power applied to the Cascade Console.	Red
Cascade Console carrying out power-on self test (POST). This may take approximately 10 seconds.	Amber
System ready (POST passed).	OFF
No connection between Cascade Console and host.	OFF
If POST failed.	Red
Establishing connection between Cascade Console and host.	Flashing green
Established connection between Cascade Console and host.	Green
Cascade Console communicating with the host.	Flashing amber

HANDHELD COMPUTER CONNECTION STATUS LEDs

There are twelve Handheld computer connection status LEDs that provide information about the infrared connection and data transfer status between the Cascade Console and the handheld computer.

These LEDs are arranged in groups of three, with each group corresponding to one extension arm attached to the console.

Note that, within each group, there is no fixed relationship between any LED and any particular cradle of an extension arm.

The color indication for each of the Handheld computer connection status LEDs is as follows:

- Flashing green - establishing connection between Cascade Console and handheld computer.

- Constant green - Connection between Cascade Console and handheld computer is established.
- Flashing amber - transfer of data between the Cascade Console and the handheld computer is in progress.

When an LED is no longer lit, the handheld computer is considered by the Cascade Console as no longer requiring communications. Because it is not possible to tell which of the handheld computers in that arm exhibits this status, you should examine the displays of each handheld computer in the affected arm to determine which unit has finished data transfer.

MAINTENANCE

Follow the simple tips and instructions included in this chapter to help prolong the life of the Cascade Console and the 3 Bay Loader-Charger extension arms and to keep them problem-free.

CLEANING

⚠ CAUTION

Always disconnect the mains power supply from the Cascade Console before you clean it. If water is allowed to enter the loader/charger or come into contact with the rear panel electrical connections it might cause damage and invalidate the warranty.

Use a non-abrasive cleaner or a damp cloth to clean the outside casing of the system. Keep the insides of the cradles clean. There is a drainage hole in the bottom of each loader/charger cradle to allow excess water to drain from the unit if you insert a wet handheld computer. Do not allow the drainage hole to become blocked or obstructed.

Ensure the top of the lightguide, visible in the base of each loader/charger cradle, is clean and free from any debris, which could interrupt the light path.

TROUBLESHOOTING Troubleshooting Guide

The following list describes possible problems associated with the Cascade Console system and suggests some corrective actions you might take to rectify these problems.

Table 1: Troubleshooting guide

Problem

The handheld computer will not charge in the Cascade Console optical loader/charger cradle.

Possible cause and solution

Try to place a different handheld in the loader/charger cradle and determine whether that unit charges normally. If it charges, the problem exists with the handheld

computer, not the Cascade Console. Check that the handheld computer is seated properly into the Cascade Console cradle and that it is not resting on its hand strap.

Check that the charge terminals are clean on both the handheld computer and in the Cascade Console cradle. The terminals on the loader/ charger cradle are protected by a shutter and are cleaned automatically as you insert and remove a handheld computer. The charge pips on the handheld computer are exposed and should be cleaned regularly, especially if you use the unit in a dirty environment.

Check that the mains power supply cable connector is properly fitted to the socket at the rear of the Cascade Console.

Check the mains connection fuse. A spare fuse is provided with the Cascade Console. When replacing a fuse always use a fuse of the same type and rating.

NOTE: Always isolate from the mains supply before you check or remove the fuse.

Check that the self-test performs satisfactorily after you power-on the system—refer to Table 1.

Try removing all handheld computers from the extension arms and restarting the Cascade Console.

Problem

There are communication problems between the Cascade Console system and the handheld computer

Possible cause and solution

If you attempt to charge a handheld computer outside its recommended temperature range 41 °F to 104 °F (5°C to 40 °C), it will not accept a charge. Move the Cascade Console system to an area that meets the temperature requirements to allow charging.

Did the power-on self-test complete successfully when you connected power to the Cascade Console system? Refer to Table 1 for details of the indicator lights. Remove all handheld computers from the extension arms and restart the Cascade Console system.

Check that the infrared window in the handheld computer is not blocked or dirty. Also check the cleanliness of the infrared ports on the optical loader/charger cradle. If necessary, use a lint-free cloth to clean the infrared windows—do not use detergents or solvents to clean these windows.

Check that the spring-loaded shutter operates correctly. As you insert the handheld computer into the cradle the shutter should move to the rear revealing the charging terminals and the infrared window. Investigate and clear any reason that prevents the shutter from opening fully.

Check that the lightguides in the base of the extension arms are seated correctly. If necessary, carefully reseal the lightguides, taking care not to damage or scratch them.

Check that you have the correct communication software installed on the host and that you are using the correct host communication port.

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Please see our website at
www.badgermeter.com
for specific contacts.

Due to continuous research, product improvements and enhancements, Badger Meter reserves the right to change product or system specifications without notice, except to the extent an outstanding bid obligation exists.



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