

快速操作说明

基于图像的条形码阅读器具有卓越的解码能力和一系列强大的镜头和光源选项

本说明旨在帮您设置和安装ABR 7000. 有关编程、性能、故障排除、尺寸和附件的完整信息, 请参阅说明书 www.bannerengineering.com. 搜索p/n 207634 查看操作说明书, 和p/n 207635 查看Barcode Manager软件操作说明书. 本文件的使用假定熟悉相关的工业标准和做法.



警告: 不要用于人员保护

切勿将此设备用作人员保护的感应装置. 这样做可能导致重伤或者死亡. 此设备不包括允许其在人员安全应用中所需的自检冗余回路. 传感器故障或失效可能导致通电或者断电输出状态.

型号

表1: ABR 7000 型号

型号	分辨率	镜头	光源	选项	通讯	条码类型
ABR7109-RSE2	1.3 MP (1280x1024 像素)	9 mm, 手动对焦	红	标准	串口/以太网	1D 和 2D
ABR7109-MSE2		9 mm, 手动对焦	多色 DPM			
ABR7112-RSE2		12 mm, 手动对焦	红			
ABR7116-RSE2		16 mm, 手动对焦	红			
ABR7106-RSE2		6 mm, 手动对焦	红			
ABR7106-MSE2		6 mm, 手动对焦	多色 DPM			
ABR71L9-RSE2		9 mm, 自动对焦	红			
ABR71L9-MSE2		9 mm, 自动对焦	多色 DPM			

特征

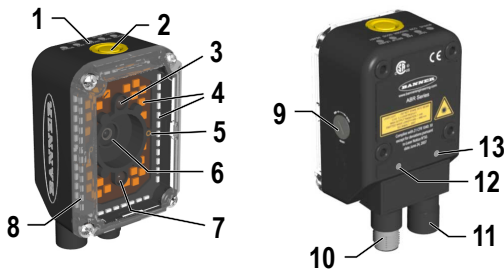


图1. 手动调整对焦型号

1. 智能示教接口区
2. 按钮
3. 良好读取 LED (绿色)
4. 内部光源
5. 瞄准系统激光指示
6. 镜头
7. 无读取 LED (红色)
8. 镜头盖
9. 对焦调整螺丝
10. 电源 - 串口 - I/O 连接
11. 以太网连接
12. 电源上电 LED
13. 以太网连接 LED

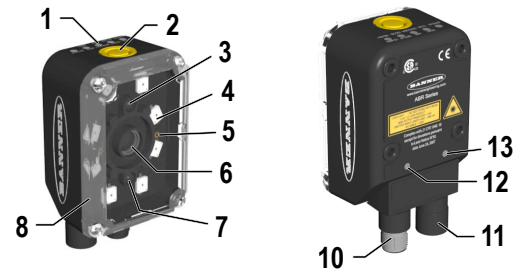


图2. 液体透镜自动对焦型号

指示灯

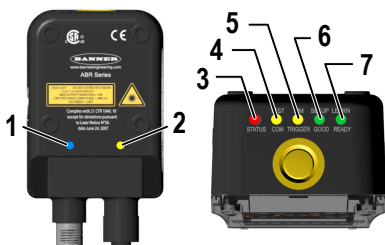


图3. 指示灯—读码器的背面和顶部

指示灯	颜色	描述
1	蓝色	指示读码器连接到供电电源
2	黄色	指示连接到以太网网络
3	红色	无读码结果
4	黄色	主串口传输输出有效结果
5	黄色	正在读取. 在当前尝试读取完成之前, 不要触发新的读取尝试
6	绿色	成功读取
7	绿色	准备好

在读码器启动期间, 所有的LED灯亮一秒钟.

当读码器处于智能示教模式时, 5个LED的颜色和含义, 请查看 [Smart Teach Interface](#) 在第三页.

激光描述和安全信息

ABR 7000 内部光源包括两个激光LED用于定位读码器。在维护或安装过程中打开设备时，断开电源，以避免暴露在危险的激光下。激光光束可以通过软件命令打开或关闭。

本产品符合 IEC 60825-1 的应用要求，符合 21 CFR 1040.10 除参照激光警告N° 50的偏差外，日期 2007年6月24日。根据IEC 60825-1 规定，该产品归为2类激光产品。



注意: 使用控制或调整或执行本文件规定以外的步骤可能导致危险辐射照射。不要尝试拆卸此传感器来进行修理。有缺陷的装置必须重新交给制造商。

安全使用激光 - 二级激光

- 不要直视激光。
- 不要把激光对着人的眼睛。
- 在实用的地方，在眼睛的上方或下方设置激光打开路径。
- 终止激光产品在其有用路径末端发射的光束。

参考 IEC 60825-1:2007, 8.2部分。



注意: 千万不要直视传感器镜头。激光会伤害你的眼睛。避免在光束中放置任何类似镜子的物体。千万不要用镜子作为反射目标。

二级激光

二级激光器是在400nm至700nm波长范围内发射可见辐射的激光器，其中眼睛保护通常由厌恶反应提供，包括眨眼反射。这种反应可能会在合理的预先观察的操作条件下提供充分的保护，包括使用光学仪器进行束内观察。

二级激光安装须知

根据定义，低功率激光器不能在眨眼（厌恶反应）0.25秒内造成眼睛损伤。它们还必须只发射可见波长(400到700 nm)。因此，只有当个体克服对强光的自然厌恶，直接盯着激光束时，眼睛才会有危险。



激光波长: 630-680 nm

输出功率: 1 mW

脉冲宽度: 可变的

安装说明

安装读码器



注意: 将装置安装在离目标10°到15°的角度，避免直接反射。

1. 将连接器插头块旋转到所需要的角度。



连接器插头块旋转90°位置

图4. 连接器插头块

2. 如果需要支架，请将设备安装到支架上。
3. 选择一个读码距离。

ABR 7000 手动对焦型号和自动对焦型号都是工厂聚焦到了精确的读码距离。

- 如果此距离适合您的应用需求，或者您用的是自动对焦型号，您可用智能示教接口安装读码器。
- 如果此距离不合适您的应用需求，并且您使用的是手动对焦型号，请使用说明手册中的软件设置描述的步骤。

下表这些显示了工厂聚焦读码距离的水平视野大小：

镜头	出厂对焦读码距离	水平视野
6 mm	85 mm (3.3 in)	121 mm (4.8 in)
9 mm	180 mm (7.1 in)	145 mm (5.7 in)
9 mm 液体透镜自动对焦	135 mm (5.3 in) ²	109 mm (4.3 in)
12 mm	250 mm (9.8 in)	145 mm (5.7 in)
16 mm	320 mm (12.6 in)	132 mm (5.2 in)

² 执行自动对焦以优化读码器其它距离应用，参见第三页的简单配置

4. Mount the device (or the device and the bracket) to the machine or equipment at the desired location. Do not tighten the mounting screws at this time.
5. Check the device alignment.
6. Tighten the mounting screws to secure the device (or the device and the bracket) in the aligned position.

Connect the Cables

Table 2: Power and I/O Pinouts for MQDC2S-17xx

Pin	Wire Color	Name	Description
1	Brown	V dc	Power Supply Input Voltage +
2	Blue	GND	Power Supply Input Voltage -
3	White	I2B	Input Signal 2 (polarity insensitive)
4 ³	Green	TX	Transmit Data of Auxiliary RS232
5	Pink	I1B	External Trigger B (polarity insensitive)
6	Yellow	I1A	External Trigger A (polarity insensitive)
7	Black	ID+	ID-NET network +
8 ³	Gray	O2	Configurable Digital Output 2 - positive pin NPN or PNP short circuit protected and software programmable
9 ³	Red	O1	Configurable Digital Output 1 - positive pin NPN or PNP short circuit protected and software programmable
13	White/Green	I2A	Input Signal 2 (polarity insensitive)
14 ³	Brown/Green	RX	Receive Data of Auxiliary RS232
15	White/Yellow	ID-	ID-NET network -
16	Yellow/Brown	O3	Output 3 NPN or PNP short circuit protected and software programmable
Connector Case	n/a	CHASSIS	Cable shield connected to chassis and 17-pin connector shell
		RS232 Main Serial Interface	RS422 FD Main Serial Interface
10	Violet	-	RX- ⁴
11	Gray/Pink	RX	RX+ ⁴
12	Red/Blue	-	TX-
17	White/Gray	TX	TX+

If using a TCNM-ACBB1 connection box, connect the reader using cable MQDEC-1703SS-DB25 and refer to the Instruction Manual for wiring details.

Use Cat 5e or superior M12 D-code cables, such as STP-M12D-4xx.

To meet EMC requirements:

- Connect the reader chassis to the plant earth ground by means of a flat copper braid shorter than 100 mm
- Connect pin "Earth" of the TCNM-ACBB1 connection box to a good earth ground
- For direct connections, connect the cable shield to the locking ring nut of the connector

Simple Configuration

From the factory, all standard 1D and 2D ABR 7000 models are set up to read Data Matrix barcodes. To configure other codes, perform the simple configuration using the Smart Teach Interface. A simple configuration does not require Barcode Manager software.

Smart Teach Interface

Smart Teach is designed to improve ease of installation and maintenance

Status information is clearly presented by means of the five colored LEDs. The single push button provides access to the following modes.

- **Test** includes bar graph visualization to check static reading performance
- **Aim/Autofocus** turns on the laser pointers to aid positioning and focusing
- **Setup** self-optimizes and auto-configures image brightness parameters
- **Learn** automatically detects and recognizes a single code which is presented to it. Successive Learns will substitute the current code. To configure multiple codes, use the Barcode Manager Auto-learn procedure

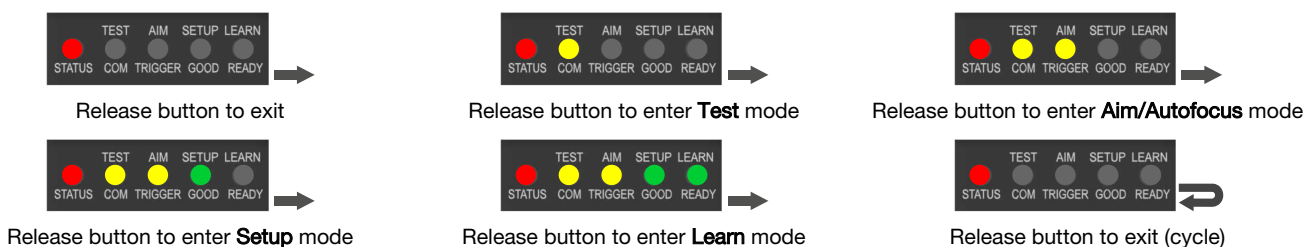
Quick access to the following modes is provided by using the push button:

1. Press the button. The **Status** LED gives visual feedback.
2. Hold the button until the specific mode LED is on (**Test**, **Aim/Autofocus**, **Setup**, or **Learn**).
3. Release the button to enter the specific mode.

After the button is pressed, the cycle of LED activation is as follows:

³ Referenced to GND; Outputs become opto-isolated and polarity sensitive when connected through the TCNM-ACBB1 connection box. See Instruction Manual for connection details.

⁴ If using RS422, do not leave floating. See the Instruction Manual for connection details.



Aim and Focus

After the ABR is focused at the correct reading distance, you must configure it for optimal code reading relative to your application.

1. Enter **Aim** mode by pressing and holding the Smart Teach button until the Aim LED is on.



Figure 5. Smart Teach Interface: Aim Mode

2. Release the button to enter **Aim** mode. The laser pointers turn on.
3. Select a single code from your application.
4. Position the code at the center of the Field of View (equidistant from the laser pointers).



Figure 6. Code Position

For liquid lens autofocus models, the reader starts taking images and performs the autofocus distance calibration. Any enabled image lighting will flash until the autofocus is complete. Aim mode ends automatically. The focus distance is the only setting that can be changed during the Aim procedure.

5. Exit **Aim** mode by pressing the Smart Teach button once. After a short delay, **Aim** mode is cancelled and the laser pointers turn off.

Setup

Once entered, the imager automatically performs the Image Acquisition parameter calibration for the specific code presented to it.

1. Enter **Setup** mode by pressing and holding the Smart Teach button until the **Setup** LED is on.



Figure 7. Smart Teach Interface: Setup Mode

2. Release the button to enter **Setup** mode. The **Setup** LED blinks until the procedure is completed. The **Setup** procedure ends when the Image Acquisition parameters are successfully saved in the reader memory, the **Setup** LED stops blinking, and the ABR emits three high pitched beeps.
3. If the calibration cannot be reached after a timeout of about 5 (five) seconds, ABR exits without saving the parameters to memory, the **Setup** LED stops blinking, and the ABR emits a long low pitched beep.

Learn

Once entered, the imager starts a procedure to automatically detect and recognize a single code⁶ which is presented to it. Successive Learns will substitute the current code. To configure multiple codes, use the Barcode Manager Auto-learn procedure.

Exit **Learn** mode at any time by pressing the Smart Teach button once. After a short delay the Learn procedure is cancelled.

1. Enter **Learn** mode by pressing and holding the Smart Teach button until the **Learn** LED is on.

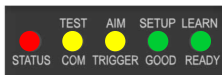


Figure 8. Smart Teach Interface: Learn Mode

2. Release the button to enter **Learn** mode. The **Learn** LED blinks until the procedure is complete. The Learn procedure ends when the Image Processing and Decoding parameters for a single code are successfully saved in the reader memory, the Green Spot is activated, the **Learn** LED stops blinking, and the ABR emits 3 high pitched beeps.

⁶ The Learn procedure does not recognize the following symbologies: Postal Codes, Pharmacode, MSI, Standard 2 of 5, or Matrix 2 of 5.

Advanced Configuration

Use the following procedures for a more advanced configuration of the ABR. Advanced configuration requires Barcode Manager software. For complete configuration instructions, refer to the Instruction Manual at www.bannerengineering.com. Search for p/n 207634 to view the Instruction Manual.

Install Barcode Manager

Administrative rights are required to install the Barcode Manager software.



Important: Install Barcode Manager on a Windows® XP, 7, 8, or 10⁷ computer. Barcode Manager does not currently support Windows Embedded (often used in industrial PCs and/or PLCs).

1. Download the latest version of Barcode Manager from www.bannerengineering.com.
2. Navigate to and open the downloaded file.
3. Run `Barcode_Manager_Setup.exe` to access the installation screen.
4. Follow the onscreen installation procedure.
After the installation is complete, the Barcode Manager entry is created under **Start > Programs > Banner Engineering**. A desktop icon is also created.

Ethernet Device Discovery

The following configuration procedure assumes that a laptop computer running Barcode Manager is connected to a factory default reader through the Ethernet port.

The Barcode Manager user interface opens and displays a list of all the devices belonging to the Local Area Network (LAN).

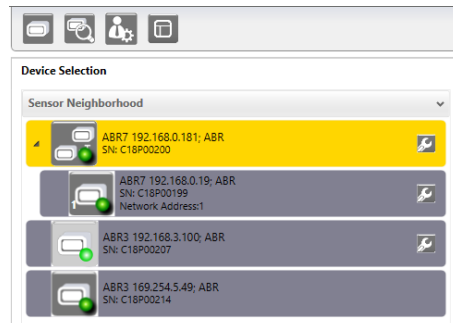




Figure 9. Device Discovery


The Barcode Manager discovery feature also shows devices not belonging to the LAN and displays them in light gray (see [Figure 9](#) on page 5). The following is an example configuration for Windows® operating system version 7, 8, or 10.

1. Confirm the network connections. Changing the Local Area Connection (LAN) properties of the programming computer to be compatible with the ABR device on the network may be required for connection.
 - a) Click the **Start** button, then on the **Start** menu, click **Control Panel** or search for **Control Panel**.
 - b) In **Control Panel**, click **Network and Internet**, then click **Network and Sharing Center**, and then click **Change adapter settings**.
 - c) Right-click on the connection that you want to change, then click **Properties**.
If you are prompted for an administrator password or confirmation, enter the password or provide confirmation.
 - d) In the connection properties, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
 - e) In the **Internet Protocol (TCP/IPv4) Properties**, select **Use the following IP address**.
 - f) Make sure that the IP address is 192.168.3.1, and the subnet mask is 255.255.255.0.
The IP address must be compatible with the default device address 192.168.3.100.
2. As an alternate method, change the IP address of the device.
3. In Barcode Manager, click  **Find Devices**.
The device displays in **Sensor Neighborhood** with a dark gray icon, meaning it is now part of the LAN and can be configured. The new IP address also displays.
4. Double-click or drag the **device**  icon into the **Selected Device Information Area**.
Details about the device display in this area.

After device discovery, configure your device through Barcode Manager. Go to [Automatic Setup](#) on page 5.

Automatic Setup

To begin configuration, the reader must be correctly mounted at the correct reading distance for your application so that its Field of View covers the application reading area.

1. Click  **Open Device Configuration**. The **Open Device Configuration** window opens showing the list of configurations (jobs) currently saved on the device. For new devices, the only saved configuration is the Default configuration.
2. Click **OK**. The device enters continuous mode and begins acquiring images.
3. Place the application code in front of the reader at the correct application reading distance.
4. If needed, focus the reader on the code.

⁷ Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.

5. After the code is positioned, click **Pause**  to stop image acquisition.



Note: If the image display area is too dark to see the images being captured, drag the Gain and Exposure Time sliders to the right to increase visibility. This will not affect Automatic Setup.

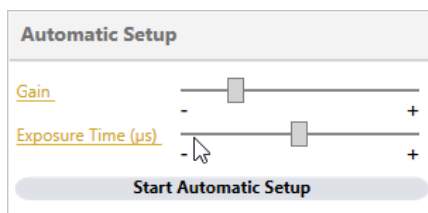


Figure 10. Gain and Exposure Time

6. Click **Start Automatic Setup**. The **Automatic Setup** window opens.

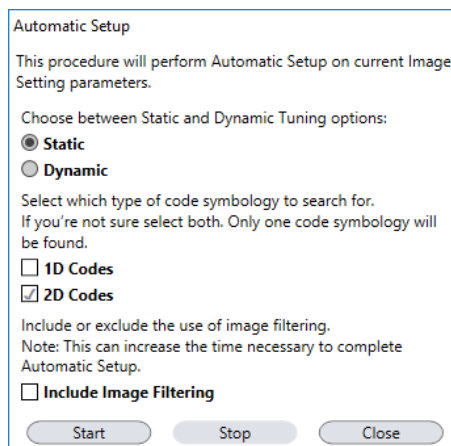


Figure 11. Automatic Setup

7. Select the correct reading conditions: **Static** or **Dynamic** Self-Tuning option, **1D** or **2D** code. Select **Include Image Filtering** to find the best decoding condition.

8. Click **Start**.

The reader begins acquiring images, adjusting the brightness and focus (for autofocus models), and adjusting the decoding settings to find a barcode and optimize reading for the first code it finds. At the end of the procedure the Status: Completed message displays.

9. Close the **Automatic Setup** window.

Your reader is now optimized for decoding. Continue setting up the reader for your application as desired. Typically, **Reading Phase** is configured next.

Specifications

Supply Voltage

10 V dc to 30 V dc

Consumption

0.7 A to 0.2 A maximum

Communication Interface

Main RS232 or RS422 full duplex: 2400 bit/s to 115200 bit/s
 Auxiliary - RS232: 2400 to 115200 bit/s
 Ethernet⁸: 10/100 Mbit/s

Inputs

Input 1 (External Trigger) and Input 2 opto-isolated and polarity insensitive

Outputs

3 NPN or PNP short circuit protected outputs available

Optical Features

See the Instruction Manual for details
 LED Safety: LED emission according to EN 62471

Imager

1.3 MP: 1280 × 1024 pixels, SXGA

Construction

Aluminum

Operating Conditions

Operating Temperature⁹: 0 °C to +50 °C (+32 °F to +122 °F)
 Liquid lens models Operating Temperature⁹: 0 °C to +45 °C (+32 °F to +113 °F)
 Storage Temperature: -20 °C to +70 °C (-4 °F to +158 °F)
 90% maximum relative humidity (non-condensing)

Environmental Rating

IEC IP67¹⁰

Parameter Storage

Permanent memory (Flash)

Other

Smart Teach Button (configurable via Barcode Manager), Beeper

Required Overcurrent Protection



WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.
 Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.
 Supply wiring leads < 24 AWG shall not be spliced.
 For additional product support, go to www.bannerengineering.com.

Supply Wiring (AWG)	Required Overcurrent Protection (Amps)
20	5.0
22	3.0
24	2.0
26	1.0
28	0.8
30	0.5

Certifications



Barcode Types

1-D and stacked		2-D	POSTAL
<ul style="list-style-type: none"> PDF417 Standard and Micro PDF417 Code 128 (GS1-128) Code 39 (Standard and Full ASCII) Code 32 MSI Standard 2 of 5 Matrix 2 of 5 	<ul style="list-style-type: none"> Interleaved 2 of 5 Codabar Code 93 Pharmacode EAN-8/13-UPC-A/E (including Addon 2 and Addon 5) GS1 DataBar Family Composite Symbologies 	<ul style="list-style-type: none"> Data Matrix ECC 200 (Standard, GS1 and Direct Marking) QR Code (Standard and Direct Marking) Micro QR Code MAXICODE Aztec Code 	<ul style="list-style-type: none"> Australia Post Royal Mail 4 State Customer Kix Code Japan Post PLANET POSTNET POSTNET (+BB) Intelligent Mail Swedish Post

FCC Statement

Modifications or changes to this equipment without the expressed written approval of Banner Engineering could void the authority to use the equipment.

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 which may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A 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 commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

PC Requirements—Barcode Manager

Administrative rights are required to install the Barcode Manager software.

Operating System

Microsoft® Windows® operating system version XP SP3, 7, 8, or 10¹¹
 Barcode Manager does not currently support Windows Embedded (often used in industrial PCs and/or PLCs)

System Type

32-bit or 64-bit

Hard Drive Space

2 GB hard disk for 64-bit machines; 1 GB hard disk for 32-bit machines

Memory (RAM)

1 GB RAM

Processor

2.00 GHz or faster microprocessor

Screen Resolution

One 19-inch or larger monitor, optimized for 1280x1024 resolution

Third-Party Software

Web Browser: Google Chrome, Mozilla Firefox, Microsoft Internet Explorer, Opera, etc.

Connection

100 Base-T Ethernet

⁸ The Ethernet interface supports application protocols: TCP/IP, EtherNet/IP, Modbus TCP

⁹ High ambient temperature applications should use metal mounting bracket for heat dissipation.

¹⁰ IEC IP67 when correctly connected to IP67 cables with seals.

¹¹ Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.

This product is covered by one or more of the following patents:

Design patents: EP002197715, JP1521956, JP1522252, USD765755, ZL201330393980.2

Utility patents: EP0996284B1, EP0999514B1, EP1014292B1, EP1128315B1, EP1396811B1, EP1413971B1, EP2517148B1, EP2649555B1, JP4435343B2, JP4571258B2, US6512218, US6616039, US6808114, US6997385, US7053954, US7387246, US8058600, US8368000, US8743263, US8886003, US8915443, US9268982, US9482793, ZL200880132595.9, ZL200980163411.X

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