Leuze electronic

the sensor people



DCR 80 Scan Engine



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1 About this document

1.1 Used symbols and signal words

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\triangle	Symbol indicating dangers to persons		
NOTICE	Signal word for property damage Indicates dangers that may result in property damage if the measures for dan- ger avoidance are not followed.		

Table 1.2: Other symbols

o	Symbol for tips
]]	Text passages with this symbol provide you with further information.
Ÿ,	Symbols for action steps Text passages with this symbol instruct you to perform actions.

Table 1.3: Terms and abbreviations

BCL	Bar code reader	
CMOS	Semiconductor process for implementing integrated circuits (Complementary Metal-Oxide-Semiconductor)	
DCR	Image-based code reader (Dual Code Reader)	
DTM	Software device manager (Device Type Manager)	
EMC	Electromagnetic compatibility	
EN	European standard	
FDT	Software frame for management of device managers (DTM) (Field Device Tool)	
FE	Functional earth	
GUI	Graphical User Interface	
HID	Device class for input devices with which users directly interact (Human Interface Device)	
IO or I/O	Input/Output	
LED	Light Emitting Diode	
PLC	Programmable Logic Control	

2 Safety

This scan engine was developed, manufactured and tested in line with the applicable safety standards. It corresponds to the state of the art.

2.1 Intended use

The DCR 80 scan engine is designed as an installation scanner with integrated decoder for all of the most popular 1D and 2D codes for automatic object recognition.

Areas of application

The DCR 80 scan engine is intended especially for the following areas of application:

- · automatic analyzers
- · For space-critical code reading tasks
- · For installation in a housing or beneath covers

Observe intended use!

b Only operate the device in accordance with its intended use.

The protection of personnel and the device cannot be guaranteed if the device is operated in a manner not complying with its intended use.

Leuze electronic GmbH + Co. KG is not liable for damages caused by improper use.

♥ Read these original operating instructions before commissioning the device.

Knowledge of the original operating instructions is an element of proper use.

NOTICE

Comply with conditions and regulations!

Observe the locally applicable legal regulations and the rules of the employer's liability insurance association.

2.2 Foreseeable misuse

Any use other than that defined under "Intended use" or which goes beyond that use is considered improper use.

In particular, use of the device is not permitted in the following cases:

- Rooms with explosive atmospheres
- · Circuits relevant to safety
- Operation for medical purposes

NOTICE

Do not modify or otherwise interfere with the device.

b Do not carry out modifications or otherwise interfere with the device.

The device must not be tampered with and must not be changed in any way.

There are no user-serviceable parts inside the device.

Repairs must only be performed by Leuze electronic GmbH + Co. KG.

2.3 Competent persons

Connection, mounting, commissioning and adjustment of the device must only be carried out by competent persons.

Prerequisites for competent persons:

- They have a suitable technical education.
- They are familiar with the rules and regulations for occupational safety and safety at work.
- They are familiar with the technical description of the device.
- They have been instructed by the responsible person on the mounting and operation of the device.

Certified electricians

Electrical work must be carried out by a certified electrician.

Due to their technical training, knowledge and experience as well as their familiarity with relevant standards and regulations, certified electricians are able to perform work on electrical systems and independently detect possible dangers.

In Germany, certified electricians must fulfill the requirements of accident-prevention regulations BGV A3 (e.g. electrician foreman). In other countries, there are respective regulations that must be observed.

2.4 Disclaimer

Leuze electronic GmbH + Co. KG is not liable in the following cases:

- The device is not being used properly.
- Reasonably foreseeable misuse is not taken into account.
- Mounting and electrical connection are not properly performed.
- Changes (e.g., constructional) are made to the device.

3 Device description

3.1 Device overview

3.1.1 The DCR 80 scan engine

The code reader is based on a scan engine with CMOS imager with integrated decoder for all of the most popular 1D and 2D codes such as DataMatrix, Aztec, QR Code, 2/5 Interleaved, Code 39, Code 128, UPC/EAN etc.

The many possible configurations of the device allow it to be adapted to a multitude of reading tasks. Due to the small dimensions of the unit and the large reading field, the scan engine can also be used in highly constrained spaces.

Information on technical data and characteristics: see chapter 11.

3.1.2 Stand alone operation

The scan engine is operated as a single "stand-alone" device. It is equipped with a 12-pin Molex plug connector for the power supply electrical connection, the interface, the trigger input and the switching output.

3.2 Performance characteristics

- High-performance miniature CMOS imager scan engine
- · Compact design for simple integration, even in constrained spaces
- Reading of extremely small high-density codes and recording of standard codes in a large reading area using a special optical system
- Reading of shiny surfaces using a gloss reduction process
- · Excellent decoding characteristics
- Clearly visible alignment LED
- RS 232 interface, triggering input, switching output, buzzer output (GOOD READ)

3.3 **Device construction**



- 5
- 6
- Figure 3.1: DCR 80 device construction

3.4 **Connection technology**

Molex connector (53398-1271), 12-pin

4 Mounting

The scan engine can be attached at four studs with an M2 internal thread.

4.1 Selecting a mounting location

- O The size of the code module influences the maximum reading distance and the width of the read-
- ing field. Therefore, when selecting a mounting location and/or the code label, take into account
- the different reading characteristics of the scanner with various code modules.

NOTICE

Observe when choosing the mounting location!

- b Maintaining the required environmental conditions (temperature, humidity).
- Possible soiling of the reading window due to liquids, abrasion by boxes, or packaging material residues.
- b Lowest possible chance of damage to the scanner by mechanical collision or jammed parts.
- Service Antipation Service (service Antipation Service Antipation Serv

In order to select the right mounting location, several factors must be considered:

- Size, orientation, and position tolerance of the bar codes or Data Matrix codes on the objects to be scanned.
- The reading field of the scan engine depends on the code module width.
- the resulting minimum and maximum reading distance from the respective reading field; see figure 11.1.
- Scan engine alignment for avoiding reflections.
- Distance between scan engine and host system with respect to the interface.

O It is advisable to use a transparent, double-sided anti-reflective coated material when installing

the scan engine behind a pane of glass. Recommended pane thickness: 1 mm; optics as flush as possible with the glass.

The best read results are obtained when

- the reading distance lies in the middle area of the reading field.
- there is no direct sunlight and extraneous light is avoided.
- the bar code labels are of good print quality and have good contrast ratios.
- you do not use high-gloss labels.
- the bar code or the Data Matrix code is moved past the reading window with a rotational angle of 10° to 15°.
- the red light beam is narrowed down for its respective reading task in order to avoid reflections on shiny components.



- The front beam exit of the scan engine is almost vertical to the optics. The code label must be
- rotated by > 10° to avoid a total reflection of the red light beam in the case of glossy labels.



Figure 4.1: Definition of the reading angles

5 Electrical connection

Safety notices

- Before connecting the device, be sure that the supply voltage agrees with the value printed on the name plate.
- Connection of the device and maintenance work while under voltage must only be carried out by a qualified electrician.
- The power supply unit for the generation of the supply voltage for the bar code reader and the corresponding connection units must have a secure electrical insulation according to IEC 60742 (PELV). For UL applications: only for use in "class 2" circuits according to NEC.
- If faults cannot be corrected, the device should be removed from operation and protected against possible commissioning.

5.1 Voltage supply

The scan engine is designed for connection to a 5 V supply voltage.

- +5 V DC (pin 1)
- GND (pin 2)

An adapter circuit board with spring terminals, Molex plug connector and 9-pin SUB-D socket is available as an accessory; see chapter 12.2 "Accessories".

- With the adapter circuit board, the 12-pin plug connector of the scan engine can be contacted via a 150 mm long interconnection cable with a 12-pin Molex terminal strip and connected to the PC via the 9-pin SUB-D socket using an RS 232 interconnection cable.
- With the adapter circuit board, the voltage supply of 10 ... 30 V DC can be fed in via spring terminals or, alternatively, 5 V DC can be fed in via a micro USB connector.

Pin	Signal	Description
1	+5 V DC Power	IN
2	GND	IN
3	BUZZER	OUT
4	SWITCHING OUTPUT	OUT
5	TRIGGER	IN
6	RS 232 RxD	IN
7	RS 232 TxD	OUT
8	RS 232 RTS	OUT
9	RS 232 CTS	IN
10		not connected
11		not connected
12		not connected

5.2 Pin assignment

5.3 Switching input/Switching output

The scan engine has a switching input **and** a switching output.

- · The switching input is used to trigger reading.
- The switching output signals successful code reading.
- An additional BUZZER output supplies a modulated signal for connecting a buzzer. The buzzer signals successful code reading.

5.3.1 Switching input

A read process can be triggered using the trigger input (pin 5) in the **standard setting** (low = active) via the connection to GND (pin 2). We recommend wiring a 2.2 k Ω "pull-up" resistor as defined cable termination; see figure 5.1.



Figure 5.1: Wiring example of the trigger input

5.3.2 Switching output

The NPN switching output connection between switching output (pin 4) and GND (pin 2) switches if a code is detected against GND.





NOTICE	
Maximum loading of the switching output	
\textcircled Do not load the switching output of the scan engine with more than 20 mA at +5 … V DC!	

5.4 PC or terminal connection

Via the serial interface, you can configure the scan engine by means of a PC or terminal. For this, you need an RS 232 connection that establishes the RxD, TxD and GND connections between PC and scan engine.

The RS 232 connection can be established in the following ways:

- Direct connection of the plug connector of the scan engine to the PC or terminal via its own connector.
- Connection via an MA-CR adapter circuit board To simplify the connection of the connection wires to the PC interface, an adapter circuit board (MA-CR) is available for implementing the 12-pin plug connector to SUB-D, 9-pin; see chapter 12.2.



- 1 RS 232 connection
- 2 CR 50 or DCR 80 connection
- 3 CR 100 or CR 55 connection
- 4 Molex Micro-Fit, 6-pin
- 5 USB connection
- 6 Connection to machine control, PLC, external voltage supply 5 VDC
- 7 External voltage supply 10 ... 30 VDC
- 8 SWIN DIP switch (level for trigger button; 5 V if the scanner high switching input is active, GND if the low input is active)
- 9 USB/PWR DIP switch (USB position if voltage is supplied via USB; PWR position if voltage is supplied via (7))
- 10 Trigger button
- 11 Status LEDs

Figure 5.3: Connection options for MA-CR adapter circuit board

5.5 Cable lengths and shielding

The maximum cable length is 3 m.

Should a cable extension be necessary, make certain that the cables of the RS 232 interface are shielded.

6 Configuration and diagnostic software - Sensor Studio

The *Sensor Studio* configuration software provides a graphical user interface for the operation, configuration and diagnosis of the device via the RS 232 interface.

A device that is not connected to the PC can be configured offline.

Configurations can be saved and reopened as projects for transferring back to the device at a later time.

Only use the Sensor Studio configuration software for products manufactured by
 ☐ Leuze electronic.

The *Sensor Studio* configuration software is offered in the following languages: German, English, French, Italian and Spanish.

The FDT frame application of the *Sensor Studio* supports all languages; all languages may not be supported in the device DTM (Device Type Manager).

The *Sensor Studio* configuration software is designed according to the FDT/DTM concept:

- You make the individual configuration settings for the bar code reader in the Device Type Manager (DTM).
- The individual DTM configurations of a project can be called up via the frame application of the Field Device Tool (FDT).
- Communication DTM for bar code readers: LeCommInterface
- Device DTM for scan engine DCR 80

Procedure for the installation of the software and hardware:

✤ Install the Sensor Studio configuration software on the PC.

✤ Install the communication and device DTM.

Communication and device DTM are included in the *LeAnalysisCollectionSetup* installation package.

- Screate DCR 80-DTM in the project tree of the Sensor Studio FDT frame.
- ♦ Connect scan engine to PC; see chapter 5.4

6.1 System requirements

To use the Sensor Studio configuration software, you need a PC or laptop with the following specifications:

Operating system	Windows XP or higher (32 bit, 64 bit) Windows Vista Windows 7 Windows 8
Computer	Processor type: 1 GHz or higher Serial COM interface CD drive Main memory (RAM): at least 64 MB Keyboard and mouse or touchpad
Graphics card	At least 1024 x 768 pixels
Required hard disk capacity for <i>Sensor Studio</i> and communication DTM	35 MB



Administrator privileges on the PC are necessary for installing Sensor Studio.

6.2 Installing Sensor Studio configuration software

- 0]]
- The installation files of the *Sensor Studio* configuration software must be downloaded from the Internet at **www.leuze.com**.

For subsequent updates, you can find the most recent version of the *Sensor Studio* installation software on the Internet at **www.leuze.com**.

6.2.1 Downloading configuration software

- ⇔ Call up the Leuze home page: www.leuze.com
- b Enter the type designation or part number of the device as the search term.
- b The configuration software can be found on the product page for the device under the *Downloads* tab.

6.2.2 Installing the Sensor Studio FDT frame

NOTICE

First install the software!

♦ Do not yet connect the device to the PC.

First install the software.



If FDT frame software is already installed on your PC, you do not need the *Sensor Studio* installation.

You can install the communication DTM and the device DTM in the existing FDT frame. Communication DTM and device DTM are included in the *LeAnalysisCollectionSetup* installation package.

- Start the PC.
- bownload the configuration software from the Internet to the PC; see chapter 6.2.1.

Unpack the installation package.

- ♦ Start the *SensorStudioSetup.exe* file.
- \clubsuit Follow the instructions on the screen.

The Installation Wizard installs the software and places a shortcut on the desktop (🌆).

6.2.3 Install the communication DTM and device DTM

Prerequisites:

- An FDT frame is installed on the PC.
- Start the LeAnalysisCollection.exe file from the installation package and follow the instructions on the screen.

The installation wizard installs communication DTM and device DTM for DCR 80.

6.2.4 Connecting device to PC

The device is connected to the PC via the RS 232 interface.

- You need an RS 232 connection that establishes the RxD, TxD and GND connections between PC and device; see chapter 5.4.
- The 5 V DC voltage supply is to be fed in externally; see chapter 5.1.

- O The MA-CR adapter circuit board with spring terminals and plug connector for connecting the de-
- vice, as well as 9-pin SUB-D socket for connecting an RS 232 interconnection cable, is available as an accessory. An RS 232 interconnection cable to the PC is also available as an accessory; see chapter 12 "Ordering information and accessories".

The adapter circuit board requires 10 V \dots 30 V DC as external voltage supply, which can be fed in via spring terminals. Alternatively, 5 V DC can be fed via the 12-pin plug connector of the DCR 80 using a 150 mm long interconnection cable with 12-pin Molex terminal strip.

6.3 Starting the *Sensor Studio*

configuration software

Prerequisites:

- The device has been mounted (see chapter 4) and connected (see chapter 5) correctly.
- The device is connected to the PC via the RS 232 interface (see chapter 6.2.4).
- The service interface is activated on the device; see chapter 0.0.3
- The *Sensor Studio* configuration software is installed on the PC (see chapter 6.2 "Installing Sensor Studio configuration software").

🗞 Start the Sensor Studio configuration software by double-clicking the Sensor Studio icon (🎑).

The mode selection of the Project Wizard is displayed.

Select the Device selection without communication connection (offline) configuration mode and click on [Next].

The **Project Wizard** displays the **device selection** list of the configurable devices.

Sensor S	itudio	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	State of Street of St	The second second	_ 🗆 X
2	Sensor Studio Project Wizard Device selection	n		🛆 Lei	IZE electronic the sensor people
Select a de	evice from the list.				
		Device	Version		Manufacturer
۱.		CR100	1.0.0.0		Leuze electronic
		DCR80	1.0.0.0		Leuze electronic
		CR50	1.0.0.4456		Leuze electronic
		CR55	1.0.0.4456		Leuze electronic
			< Back	Next >	Cancel

Figure 6.1: Device selection for scan engine DCR 80

Select DCR 80 in the device selection and click on [Next].

The device manager (DTM) of the connected DCR 80 starts with the offline view for the *Sensor Studio* configuration project.

Setablish the online connection to the connected DCR 80.

In the *Sensor Studio* FDT frame, click on the [Establish connection with device] button (). In the *Sensor Studio* FDT frame, click on the [Upload parameters to device] button (). The current configuration data is displayed in the device manager (DTM).



Figure 6.2: Configuration project: Sensor Studio device manager (DTM) for DCR 80

The menus of the Sensor Studio device manager (DTM) can be used to change or read out the configuration of the connected device.

The user interface of the *Sensor Studio* device manager (DTM) is largely self-explanatory.

The online help system provides information on the menu items and adjustment parameters. Select the **Help** menu item in the menu [?] (0).

Stransfer the modified configuration parameters to the device.

If a connection exists, click on the [Download parameters to device] button (🜉) on the task bar.

6.4 Exiting Sensor Studio

After completing the configuration settings, close the Sensor Studio configuration software

♦ Exit the program via File > Exit.

Save the configuration settings as a configuration project on the PC.

You can open the configuration project again at later time via **File > Open** or with the *Sensor Studio* **Project Wizard** (

6.5 Configuration parameters

In this chapter, you will find information and explanations on the configuration parameters of the device manager (DTM) for the scan engine DCR 80.



This chapter does not include a complete description of the *Sensor Studio* configuration software.

Complete information on the FDT frame menu and on the functions in the device manager (DTM) can be found in the online help system.

The device manager (DTM) for the scan engine DCR 80 of the *Sensor Studio* configuration software offers the following configuration functions:

- General (Control)
- Decode; see chapter 6.5.2
- Host Interface; see chapter 6.5.3
- Diagnosis; see chapter 6.5.4

O The online help system displays information on the menu items and configuration parameters for

each function. Select the **Help** menu item in the menu [?]

6.5.1 Control tab

ROHA: MAD	3 3	C.C. NIMIR DIN 0.	
DCRS0 - Main operation			
DCR80			4 Leuze electronic
Analysis Automat	tion		the sensor people
		IDENTIFICATION CONFIGURATION DIAGNOSIS	
. 0			0
CONFIGURATION	CONTROL		
Decode	connor		
1D Codes	SCAN OPTIONS		the sensor people
Stacked Codes	Trigger Duration	0 🛟 ms	Control
Output	Decode Area	Read in Both Fields	Control
Host Interface	Continuous Artino	kite -	
	Contraction Paragent		Scan Options
	Mumination	Minimum Illumination •	Trigger Duration
	Targeting	Targeting enabled	processes a reader cycle after a
	Ternet Time Before Decode	0 2 ms	tngger event.
			Decode Area The code reader combinds two
		Ginre Detection	unique fields of view, a high- , density field and a wide angle
	GENERAL OPTIONS		field. This parameter inables the
	Beep Volume	M •	decoder either te decode in both fields or to be linited to only one of the two fields.
			Continuous Action
			The default value of this is the Ide Event. This neares that normally no activity is occurring. If the value is set to one of the other options, then that action will be repeated continuously, unless interrupted by an external trigger event or command.
			Illumination
			When Minimum Illumination is set, the spring stops (flashes) during read cycle whenever not needed. Otherwise the light stops on until



Trigger duration	Set the time, for which a read cycle remains active after a trigger event. Example: trigger duration = 3000 ms means that the scanner tries to decode a code for a maximum of three seconds after a trigger event. The read cycle ends after successful decoding or after the time that has been preset here has relapsed.
Reading fields (Decode Area)	Selection of the reading field. The scan engine has two reading fields:High resolution reading fieldWide-range reading field
Scan Mode (Continuous Action)	Selection of the reading behavior:Read when triggeredPresentation modeDuration reading
LED illumination (Illumination)	Set the illumination time of the LEDs after successful reading.

Target illumination (Targeting)	Switch the blue alignment LEDs on and off.
Target illumination time set- ting (Target Time before Decode)	Setting of the time until which reading takes place after a trigger event. The blue alignment LEDs light up immediately when the trigger event occurs.
General Settings (General Options)	Settings for the buzzer

6.5.2 Decode tab

DCR80					4 Leuze electron
Analysis Automatio	n				the sensor peo
0		IDENTIF	ICATION CONFIGURATION DIAGNOSIS		18
	10 00000				
HOURATION	10 CODES				4 Leuze electron
1D Codes	1D-CODE SYMBOLOGIES				the sensor peo
Code 39 / Code	Interleaved 2 of 5 Decoding		J Code 39 Decoding		1D-Codes
Code 128	Code 128 Decoding	(and)	Code 32 Decoding	(and)	
Code 93	UPC and EAN Codes Enabled		GS1 DetaBer Omnidirectional Decoding		1D-Code Symbologies
MSI Plessey Stacked Codes	Codeber Decoding		GS1 DetaBer Limited Decoding		The overview shows all the supported 1D Code Symbologies They can all be enabled or
2D Codes DataMatrix	Code 93 Decoding		GS1 DetaBer Expended Decoding		disabled directly at the overview with the related check boxes. More detailed settings can be
QR Code	MSI Plessey Decoding				configured at the symbology specific sub-pages. These scree are accessible via the left
iontrol lost Interface	1D-CODE PROPERTIES				 navigation tree or by pressing the function of the right of each code check box.
	1D Barcode Aggressiveness	Most Aggressive +			
	COMMON DECODE PROPERTIES				1D-Code Properties
	Maximum labels to decode	1 💠			1D Barcode Aggressiveness This feature allows to minimize
	Ignore Duplicate Codes	0 🗘 ms			misreads on poor printed 1D barcodes.
					Common Decode Properties
					These common decode propertie apply to all symbologies - 1D-, Stacked- and 2D-Codes
					Maximum tabals to decede

Figure 6.4: Decode tab

Code table (DECODE)	Here, the codes which are to be decoded are set. We recommend enabling only the code types which are to actually be read with the corresponding element num- bers. Codes which are not enabled are not decoded!
Properties (SYMBOLOGIES)	Use the [] button to the right of the given code to select the code-specific set- tings. Alternatively, the property settings can be selected directly via the navigation tree under the [Decode] button. The properties can be individually set for each code type .

Sensor Studio - New Project	answed	_ • X
File Edit View Device T	ools Window ?	
WDCR20 - Main operation	U. BUSSORECONDECCE	• ×
Code Reader Analysis Automatic	n	Leuze electronic the sensor people
. 0	IDENTIFICATION CONSTRUIRATION DIAGNOSIS	0
CONFIGURATION	DATAMATRIX	▲ Leuze electronic
Decode	DATAMATRIX SYMBOLGY SETTINGS	the sensor people
ID Cooles and 2 of Indexing and 2 of Coole UPC / FAU Coole UPC / FAU Coole UPC / FAU Coole 128 Coole 93 Coole 93	 ✓ Brender: DetaMetrix Decoding ✓ Inverse DataMetrix Decoding ✓ Rectangular DetaMetrix Symbology 	DataMatrix Code Synbology Settings Standard DataMatrix Decoding DataMatrix Code Occoding, Trables or disable discoding of DataMatrix Code Occoding, Trables or disable discoding of disables disable discoding of disables disables discoding of micro DataMatrix Code, Brables or disables discoding of Insules or disables discoding of Insules or disables discoding of Probles of DataMatrix Brables or disables discoding of Probles of DataMatrix Brables or disables discoding of Probles of DataMatrix Scode,
•		
⊕Connected t	Administrator	

Figure 6.5: Standard settings for the Properties window (SYMBOLOGY SETTINGS) - Decode tab

6.5.3 Host interface tab

DCR80 Code Reader Analysis Automatio	n	IDENTIFICATION CONFIGURATION DIAGNOSIS	Leuze electronic the sensor people
— - (9)			0.
CONFIGURATION Decode Decode Code 39 / Code Code UPC / EM Code UPC / EM Code 188 Code 180 Code 180 Code 180 Code 180 Code 180 Code 180 Code 280 Code 180 Code 280 Code 200 Code 200	HOST INTERFACE RS22 SETTINGS Beud Rate Data Length Panky Stop Bits Flow Control	115.200 Beud 8.68a • nome • 1.8a • Omabled •	Leuze electronic The sensor people Host Interface Rs 232 Settings Raid late Specifies the number of transferred symbols per second. Data length The identify of data bits in each character.
Antec QRI Code Control Recentencia	HANDSHAVE SETTINGS	Acknowledgement Expected 700 © me	Pany An regular data bit for simple transmission error detection. Strate Strate

Figure 6.6: Host interface tab

Select the desired baud rate, the stop bits, the data bits, the parity and various transmission modes here. The desired acknowledgment settings are also to be set in this selection window.

6.5.4 Diagnosis / Terminal

Sensor Studio - New Project <unsaved></unsaved>			_ 🗇 🗙
File Edit View Device Tools Window			
G 🛛 🖬 💩 🖉 🕫 D 📓 🖉 • 📓 🕨 🕯	1 2 3 O P. P. C C S MAR O NO .		
Au DCR80 - Main operation			• ×
DCR80			Leuze electronic
Code Reader			the service people
Analysis Automation			
	IDENTIFICATION CONFIGURATION DIAGNOSIS		
💻 🐇 🗶 🚆 🚍			0.
DIAGNOSIS TERMINAL			▲ Leuze electronic
Terminal	2.24 00000 - 0000001010002220		the sensor people
034: 17:5:	1:34 DCR80 -> 65520100001810503/33	Version	
036: 17:5	134 DCR80 -> 89620160001816903739	Dura	Terminal
037: 17:53	1:35 DCR80 -> 89620160001816903739	Poeset	
038: 17:53	3:35 DCR80 -> 89620160001816903739		The Terminal provides the
039: 17:53	3:35 DCR80 -> 89620160001816903739	Decode Area	possibility to send online commands
040: 17:5	1:36 DCR80 -> 93	Both Fields	purpose.
041: 17:5	3:36 DCR80 -> 89620160001816903739	High Density Field	
842: 17:5	1:37 DCR80 -> 89520150001815009738	P Wide Angle Field	It also allows monitoring the
944: 17:5	1:45 DCR08 -> 05020100001010700/30		acarete conport.
045: 17:5	151 DCR80 -> 50129208	Activate Decoding	The content of the terminal screen
846: 17:5	3:51 DCR80 -> 50129208	Descripte Decoding	can be printed out or stored to a file for further office analysis.
047: 17:5	3:51 DCR80 -> 50129208	Descarate Decounty	
948: 17:5	3:51 DCR80 -> 50129208	Start Continuous Scan	
049: 17:5	1:56 DCR80 -> 50129208;R1516999026;-;001	oran commoder ocan	
050: 17:5	3:56 DCR80 -> 58129288;R1516999826;-;001	Stop Continuous Scan	
051: 17:5:	/:57 DCR80 -> 50129208;R1516999026;-;001		
052: 17:5:	1:59 DLR80 -> 50129208		
954: 17:54	1.05 DCR06 -> 50129286		
855: 17:54	115 DCR80 -> 89620160001816908738		
056: 17:54	\$:19 DCR80 -> 89620160001816908738		
057: 17:54	4:27 DCR80 -> 50129208		
058: 17:54	4:38 PC -> P(C4)FF		
059: 17:54	1:38 DCR80 -> d		
		Send	
Connected Q	Administrator		

Figure 6.7: Terminal

The Terminal tab provides the following functions:

- Send online commands to the scan engine for diagnostic purposes.
- Visualize the output of the scan engine.

The contents of the terminal display can be printed out or saved in a file for subsequent offline evaluation.

7 Starting up the device - Configuration

7.1 Measures to be performed prior to the initial commissioning

NOTICE

Please observe the notices for device arrangement, see chapter 4.1.

If possible, always trigger the scanner with the aid of commands or an external signal transmitter (photoelectric sensor).

before commissioning, familiarize yourself with the operation and configuration of the device(s).

Before connecting the supply voltage, recheck all connections and ensure that they have been properly made.

7.2 Starting the device

7.2.1 Interface

Proper function of the interface can be most easily tested in service operation using the serial interface with the *Sensor Studio* configuration software and a notebook computer.

7.2.2 "Online commands"

Using the "Online" commands, important device functions can be checked, e.g. reading activation.

7.2.3 Problems

If a problem occurs that cannot be rectified even after checking all electrical connections and settings on the devices and on the host, contact your responsible Leuze electronic subsidiary or Leuze electronic customer service, see chapter 10.

7.3 Setting the communication parameters

You have now commissioned the device. Usually, you will have to configure it before you can use it. Using the configuration options offered in the *Sensor Studio* or by means of the device DTM, the device can be individually configured according to your application. For information on the various configuration options, see chapter 6 or refer to the online help.

It is normally sufficient to set the code type and code length in accordance with the 1D or 2D codes that are to be read in order to be able to operate the scan engine.

The setting of code type and code length is usually accomplished by using the *Sensor Studio* configuration software, see chapter 6.

8 Online commands

8.1 Overview of commands and parameters

Online commands can be used to send commands directly to the device for control and configuration. For this, the scan engine has to be connected to a computer (host) via the serial interface.

Using the "online" commands you can:

- query the device version.
- activate and deactivate code reading.
- perform a software reset.

Command syntax

<cmd-prefix><cmd-type><data-size>[<data>]<reserved><crc></crc></reserved></data></data-size></cmd-type></cmd-prefix>		
<cmd-prefix></cmd-prefix>	<0xEE><0xEE><0xEE>	
<cmd-type></cmd-type>	One ASCII character	
<data-size></data-size>	Byte value 0 … 240 Number of bytes in <data></data>	
[<data>]</data>	Optional: command data (byte values) in range of 0 255	
<reserved></reserved>	One byte, always <0x00>	
<crc></crc>	Two bytes crc16 check sum	

Answer syntax

<start-tag><packet-type>[<packet-data>]<eot></eot></packet-data></packet-type></start-tag>	
<start-tag></start-tag>	<0x01>X<0x1E>ap/
<packet-type></packet-type>	One ASCII character
[<packet-data>]</packet-data>	Optional: answer data
<eot></eot>	One byte <eot> (<0x04> hex.)</eot>

8.2 General online commands

Software version number

Command	<cmd-prefix>I<0x00><0x00><0x03><0x3C></cmd-prefix>
Description	Requests device version information
Parameter	none
Answer	<start-tag>iVVVVWWWWXXXXSSSSSSSSSSSSAOODYYYYHHIIIIJJJJKKKKLLLL <tab>ZZ<eot> i: "I" string output VVVV: application firmware version number WWWW:core application firmware version number XXXX: reserved A: current execution state: "A": core is running OO: OEM identifier D: display type "0": no display device YYYY: reserved HH: hardware version IIII: hardware type identifier (value in register 21B) JJJJ: boot application version KKKK: operating system kernel version LLLL: root file-system version <tab>: ASCII TAB character</tab> ZZ: OEM decoder version: null-terminated string of printable ASCII characters </eot></tab></start-tag>

Software reset

Command	<cmd-prefix>Z<0x01>1<0x00><0x1C><0x04></cmd-prefix>
Description	Carries out a software reset. The device is restarted and reinitialized, leaving it in the same state as when the supply voltage is switched on.
Parameter	none
Acknowledgment	<start-tag>d<eot> "d": done response</eot></start-tag>

Start decoding

Command	<cmd-prefix>P<0x0C>(35)7FFFFFF<0x00><0x57><0x5F> <cmd-prefix>\$<0x01><0x03><0x00><0x1F><0x5C></cmd-prefix></cmd-prefix>
Description	The command consists of two individual commands.The first command sets the decoder duration to infinity.The second command activates decoding.
Parameter	none
Acknowledgment	<start-tag>d<eot> "d": done response (twice)</eot></start-tag>

Stop decoding

Command	<cmd-prefix>P<0x0C>(35)0<0x00><0x57><0x5F></cmd-prefix>	
Description	The command sets the decoder duration to zero and stops decoding.	
Parameter	none	
Acknowledgment	<start-tag>d<eot> "d": done response</eot></start-tag>	

Start continuous decoding

Command	<cmd-prefix>P<0x06>(C4)03<0x00><0x01><0x75></cmd-prefix>	
Description	The command activates duration decoding. The read result is continuously output until it is terminated by a command.	
Parameter	none	
Acknowledgment	<start-tag>d<eot> "d": done response</eot></start-tag>	

End continuous decoding

Command	<cmd-prefix>P<0x06>(C4)FF<0x00><0x1C><0x71></cmd-prefix>	
Description	The command ends duration decoding.	
Parameter	none	
Acknowledgment	<start-tag>d<eot> "d": done response</eot></start-tag>	

9 Care, maintenance and disposal

Usually, the bar code reader does not require any maintenance by the operator.

9.1 Cleaning

Clean the glass window of the bar code reader with a soft cloth before mounting.

NOTICE

Do not use aggressive cleaning agents!

✤ Do not use aggressive cleaning agents such as thinner or acetone to clean the device.

9.2 Servicing

Repairs to the device must only be carried out by the manufacturer.

For repairs, contact your responsible Leuze electronic subsidiary or Leuze electronic customer service (see chapter 10).

9.3 Disposing

以 For disposal observe the applicable national regulations regarding electronic components.

10 Service and support

24-hour on-call service at: +49 (0) 7021 573-0

Service hotline: +49 (0) 7021 573-123 Monday to Friday 8.00 a.m. to 5.00 p.m. (UTC+1)

E-mail: service.identify@leuze.de

Return address for repairs: Service center Leuze electronic GmbH + Co. KG In der Braike 1 D-73277 Owen / Germany

10.1 What to do should servicing be required?

NOTICE

Please use this chapter as a master copy should servicing be required!

Enter the contact information and fax the form together with your service order to the fax number given below.

Customer data (please complete)

Device type:	
Serial number:	
Firmware:	
Display messages:	
LED states:	
Error description:	
Company:	
Contact person/department:	
Phone (direct):	
Fax:	
Street/No:	
ZIP code/City:	
Country:	

Leuze Service fax number: +49 (0) 7021 573-199

11 Technical data

11.1 General specifications

Table 11.1: Optics

Optical system	CMOS Imager, Rolling Shutter (1280 x 960)	
Optical resolution	High-resolution reading field 960 x 640 Wide-range reading field 960 x 640	
Reading area	20 mm 300 mm	
Contrast	1D code: 25 % 2D code: 35 %	
Resolution	1D code: m =0 .076 mm (3 mil), distance depen- dent 2D code: m = 0.127 mm (5 mil), distance depen- dent	
Light sources Illumination Alignment LEDs (Aimer) 	Integrated LEDs visible red light visible blue light 	

Table 11.2:Code specifications

Code type: 1D	Codabar, Code 11, Code 32, Code 39, Code 93, Code 128, Interleaved 2 of 5, GS1 DataBar (RSS), MSI Plessey, Pharmacode, UPC/EAN, 2 of 5 (IATA, Matrix, Hong Kong, Straight, NEC), Telepen	
Code type: Stacked 1D	PDF417, MicroPDF, GS1 Composite, Codablock F	
Code type: 2D	Data Matrix, Aztec Code, QR Code, Micro QR, MaxiCode	
Postal Codes	Australian Post, Intelligent Mail, Japan Post, KIX Code, Korea Post, Planet, Postnet, UK Royal Mail, UPU ID Tags	

Table 11.3: Interfaces

Interface type	RS 232	
Baud rate	9600 115200 baud, configurable	
Data formats	Configurable	
Trigger	 Switching input active: 0 V inactive: +5 V or not connected Presentation Mode (Motion Control) 	
Switching output	NPN transistor output, max. 20 mA, Good Read	
Buzzer	NPN transistor output, modulated, Good Read	

Table 11.4: Electrical equipment

Supply voltage	3.3 5.5 V DC	
Current consumption	Duration reading: typ. 350 mA Inactive illumination: typ. 75 mA	

Table 11.5: Mechanics

Connection type	Molex Inc. (53398-1271), 12-pin	
Weight	20 g	
Dimensions (HxWxD)	27 x 45 x 25 mm	
Fastening	4x M2 threaded inserts, 2 mm deep	

Table 11.6: Environmental data

Ambient temp. (operation/storage)	0 °C +50 °C/-20 °C +60 °C	
Air humidity	10 % 90 % rel. humidity, non-condensing	
Ambient light	Max. 100000 Lux	
Electromagnetic compatibility	EN 55022:2006 Class B IEC 62471:2006	
Conformity	CE, FCC	

Reading fields 11.2

Please note that the actual reading fields are also influenced by factors such as labeling material, 0]]

printing quality, scanning angle, printing contrast etc., and may thus deviate from the reading fields specified here. The origin of the read distance always refers to the front edge of the housing of the beam exit.



- Reading fields side view Reading fields top view High-resolution reading field Wide-range reading field 1 2 3
- 4

Figure 11.1: DCR 80 reading field

Та	ble	11.	7:	Reading	fields
----	-----	-----	----	---------	--------

Code type	Resolution	Typical reading distance [mm]	
Code 39	0.076 mm (3 mil)	80 102	
Code 39	0.190 mm (7.5 mil)	33 182	
GS1 Data bar	0.267 mm (10.5 mil)	20 220	
UPC Data bar	0.330 mm (13 mil)	28 280	
Data Matrix	0.127 mm (5 mil)	43 115	
Data Matrix	0.160 mm (6.3 mil)	33 150	
Data Matrix	0.254 mm (10 mil)	20 180	
Data Matrix	0.528 mm (20.8 mil)	28 343	

11.3 Dimensioned drawings





all dimensions in mm

Figure 11.2: DCR 80 dimensioned drawing

It is advisable to use a transparent, double-sided anti-reflective coated material when installing the scan engine behind a pane of glass. Recommended pane thickness: 1 mm; optics as flush as possible with the glass.

12 Ordering information and accessories

12.1 Type overview

Table 12.1:	Part numbers

Part no.	Part designation	Description
50129208	DCR80M2/R2-S5	CMOS Imager Scan Engine for 1D and 2D codes, RS 232 interface, Molex 53398-1271 connection, 12-pin

12.2 Accessories

Table 12.2: Accessories

Part no.	Part designation	Description
50128204	MA-CR	Adapter circuit board for contacting the 12-pin plug connector and conversion to SUB-D, 9-pin
50113396	KB DSub-9P-3000	RS 232 interconnection cable, cable length 3 m
<i>Sensor Studio</i> configuration software Download at www.leuze.com see chapter 6.2.1 "Downloading configuration soft- ware"		<i>Sensor Studio</i> designed according to the FDT/ DTM concept. Contains: communication DTM and device DTM

13 EC Declaration of Conformity

The scan engines of the DCR 80 series have been developed and manufactured in accordance with the applicable European standards and directives.



14 Appendix

14.1 Bar code samples



Module 0.3

Figure 14.1: Code type 01: Interleaved 2 of 5



35AC

Module 0.3

Figure 14.2: Code type 02: Code 39



1314a

Module 0.3

Figure 14.3: Code type 11: Codabar



abcde

Module 0.3

Figure 14.4: Code 128



leuze

Module 0.3

Figure 14.5: Code type 08: EAN 128



78901 SC 2

Figure 14.6: Code type 06: UPC-A



SC 3

Figure 14.7: Code type 07: EAN 8

Appendix



14.2 Configuration via configuration codes

The scan engine DCR 80 can also be configured using parameter codes. The device parameters in the device are set and permanently saved after reading this code.

DCR 80 Configuration Guide			
	Continuous Scan On	Continuous Scan Off - Default	Motion Detection On when In Stand and Trigger Out of Stand - Default
General Reading Mode			
Settings	1773	開始際	
	M10012_02	M10011_01	M10403_02
	A2	A3	Α4
Motion Detection On In and Out of Stand	Optimize Motion Detection for Bright Environments - Default	Optimize Motion Detection for Dark Environments	No Motion Detection Delay - Default
NACESCIE VIELENARS	[X2903	No.	1000
M10404_02	M10014_03	M10015_03	M10016_03
B1	B2	B3	B4
500ms Motion Detection Delay	Motion Detection Off In and Out of Stand	Anti-Glare On	Anti-Glare Off - Default
15568	16/258	16/855	16225
MI0017-03	M10013_02	M10352_01	M10433_01
C1	C2	C3	C4
Mirroring On	Mirroring Off - Default	Targeting On - Default	Targeting Off
16/204	1602404	18/22/14	Terrologi
M10125_01	M10124_02	M10135_01	M10154_01
Cell Phone Reading	Cell Phone Reading	03	Erase Prefix & Suffix Data -
Liniancement UN	chnancement off - Default	Data Farmatting	netanit
		(Prefix/Suffix) Settings	
	1972-00 1972-00 1972-00		1.000
M10163_01	M10162_01		M10135_01
E1	E2		E4

Figure 14.9: DCR 80 Configuration Guide

DCR 80 Configuration	n Guide		
Erase Prefix Data - Default	Erase Suffix Data - Default	Prefix AIM ID On	Prefix AIM ID Off - Default
M10126_01	M10130_01	M10199_01	M10198_01
A1	A2	A3	A4
Prefix Carriage Return Line Feed (RS232 Mode Only)	Prefix Comma	Prefix Space	Prefix Tab (RS232 Mode Only)
M10405_01	M10127_01	M10128_01	M10319_01
B1	B2	B3	B4
Suffix Carriage Return (RS232 Mode Only)	Suffix Carriage Return Line Feed (RS232 Mode Only)	Suffix Comma	Suffix Line Feed (RS232 Mode Only)
M10320_01	M10322_01	MIOI31_01	M10321_01
Suffix Space	Suffix Tab (RS232 Mode Only)	Translate all Characters to Uppercase On	Translate all Characters to Uppercase Off - Default
M10132_01	M10323_01	M10220_03	M10426_02
D1	D2	D3	Jatas On Default
Symbology Settings	Australian Post On	Australian Post Off - Default	Aztec On - Default
	M10288_02	M10289_02	M10018_01
	E2	E3	E4

Figure 14.10:DCR 80 Configuration Guide

DCR 80 Configuratio	n Guide		
Aztec Inverse On	Aztec Inverse & Normal On	Aztec Off	Codabar On - Default
M10020_01	M10021_01	M10019_01	M10022_01
A1	A2	A3	A4
Codabar Off	Codablock F On	Codablock F Off - Default	Code 11 On
M10023_01	M10027_01	M10026_01	M10029_01
B1	B2	B3	B4
M10028_01	from Result On	On M10239_02	Off - Default
C1	C2	C3	C4
Code 39 On - Default	Code 39 Off	Code 39 Checksum On	Code 39 Checksum Off - Default
M10033_02	M10034_02	M10036_01	M10035_01
Code 39 Checksum Strinned	UZ Code 39 Extended Full ASCII	U3 Code 39 Extended Full ASCII	D4 Code 93 An - Default
from Result On	On	Off - Default	
M10037_01	M10039_01	M10038_01	M10042_01
E1	E2	E3	E4

Figure 14.11:DCR 80 Configuration Guide

DCR 80 Configuratio	n Guide		
Code 93 Off	Code 128 On - Default	Code 128 Off	Composite On
M10043_01	M10044_01	M10045_01	M10047_01
A1	A2	A3	Α4
Composite Off - Default	Data Matrix Inverse On - Default	Data Matrix Inverse Off	All GS1 DataBar On - Default
M10046_01	M10051_03	M10050_03	M10054_01
B1	B2	B3	B4
All GS1 DataBar Off	GS1 DataBar Omnidirectional and GS1 DataBar Truncated On	GS1 DataBar Omnidirectional and GS1 DataBar Truncated Off	GS1 DataBar Expanded On
M10055_01	M10057_03	M10355_02	M10059_03
C1 DatePar Expanded Off	C2	C3	C4
651 Databai Expanded On	On	Off Databal Expanded Stacked	621 Datapar Limiten on
M10417_02	M10357_02	M10356_02	M10056_03
D1	D2	D3	D4
GS1 DataBar Limited Off	GS1 DataBar Stacked and GS1 DataBar Stacked Omnidirectional On	GS1 DataBar Stacked and GS1 DataBar Stacked Omnidirectional Off	Han Xin On
M10354_02	M10058_03	M10353_03	M10248_01
E1	E2	E3	E4

Figure 14.12:DCR 80 Configuration Guide

DCR 80 Configuratio	n Guide		
Han Xin Off - Default	Hong Kong 2 of 5 On	Hong Kong 2 of 5 Off - Default	Int 2 of 5 On - Default
M10249_01	M10079_01	M10078_02	M10060_01
A1	A2	A3	A4
int 2 01 3 011		Default	from Result On
M10061_01	M10235_01	M10234_01	M10065_01
B1	B2	B3	KIX (Butch Post) Code Off
M10292_02	M10293_02	M10290_02	Default
C1 Korean Post On	C2 Korean Post Off - Default	C3 Maxicode On	C4 Maxicode Off - Default
M10358_01	M10359_01	M10067_02	M10066_01
D1	D2	D3	D4
Matrix 2 of 5 On M10069_01	Matrix 2 of 5 Off - Default	Micro PDF417 On Mi0073_01	Micro PDF417 Off - Default
E1	E2	E3	E4

Figure 14.13:DCR 80 Configuration Guide

DCR 80 Configuratio	n Guide		
MSI Plessey On	MSI Plessey Off - Default	NEC 2 of 5 On	NEC 2 of 5 Off - Default
18723	19768	19788	187725
M10076_01	M10077_01	M10082_01	M10083_01
A1	A2	A3	A4
PDF417 On - Default	PDF417 Off	Pharmacode On	Pharmacode Off - Default
1998	15,655	192395	1223
M10070_01	M10071_01	M10275_02	M10274_03
B1	B2	B3	B4
Pharmacode Normal Barcode Decoding (Left to Right)	Pharmacode Reverse Barcode Decoding (Right to Left)	All QR Code On	All QR Code Off
19258	1933	Income.	1 893.03
M10281_02	M10280_02	M10101_02	M10351_03
C1	C2	C3	C4
Standard QR Code On - Default	Straight 2 of 5 On	Straight 2 of 5 Off - Default	Telepen On
	1828	1728	13249
M10095_04	M10241_01	M10240_01	M10103_01
D1	D2	D3	D4
Telepen Utt - Detault	Trioptic Un	Trioptic Utt - Detault	UK Plessey Un
15728	NYE:	12.20	15523
M10104_01	M10041_01	M10040_01	M10237_02
E1	E2	E3	E4

Figure 14.14:DCR 80 Configuration Guide

UK Plessey Off - Default UK Royal Mail On UK Royal Mail Off - Default UPC On - Image: Second condition of the se	
Image: Millogage of the second sec	Default
A1 A2 A3 UPC Off UPC E Expansion On UPC E Expansion Off - Default UPC Supples INNEL INNEL INNEL INNEL	5_01
UPC Off UPC E Expansion On UPC E Expansion Off - Default UPC Supplementation of the second se	Δ4
1976): 1976): 1976): 1976): 1976):	mental On
M10106_01 M10108_01 M10107_01 M10107	
B1 B2 B3	B4
UPC Supplemental Off - Default UPU ID-Tag On UPU ID-Tag Off - Default USPS Intellige 4-State	ent Mail/IMB/ CB On
M10109_01 M10360_02 M10361_02 M10284	6_02
C1 C2 C3	C4
4-State CB Off - Default	utt - Detault
M10287_02 M10284_02 M10283_02 M10283_02	5_02
D1 D2 D3	D4
Defaults Rat	te izou bauu
RS232 Settings	2_01

Figure 14.15:DCR 80 Configuration Guide

DCR 80 Configuratio	n Guide		
RS232 Interface 2400 Baud Rate	RS232 Interface 4800 Baud Rate	RS232 Interface 9600 Baud Rate	RS232 Interface 19200 Baud Rate
M10393_01	M10394_01	M10395_01	M10396_01
A1	A2	A3	A4
RS232 Interface 38400 Baud Rate	RS232 Interface 57600 Baud Rate	RS232 Interface 115200 Baud Rate - Default	RS232 Interface 7 Data Bits
M10397_01	M10398_01	M10399_01	M10390_01
B1	B2	B3	B4
RS232 Interface 8 Data Bits - Default	RS232 Interface Stop Bits 1 - Default	RS232 Interface Stop Bits 2	RS232 Interface Even Parity
M10391_01	M10406_01	M10407_01	M10400_01
RS232 Interface Odd Parity	RS232 Interface No Parity - Default	RS232 Interface Flow Control Off - Default	RS232 Interface Flow Control - Hardware
M10401_01	M10402_01	M10408_01	M10409_01
D1	D2	D3	D4
RSZ32 Packet Mode	KSZ32 KAW Mode - Detault	Reader Feedback Settings	Beep Volume 100% - Default
E1	E2		E4

Figure 14.16:DCR 80 Configuration Guide

DCR 80 Configuratio	n Guide		
Beep Volume 67%	Beep Volume 33%	Beep Volume 0%	Intentionally Blank
1888	19/684	197884	
M10196_01	M10195_01	M10194_01	
A1	A2	A3	Α4
	Duplicate Scan Disabled - Default	1 Second Duplicate Scan Delay	2 Second Duplicate Scan Delay
Scan Delay Settings			
	M10144_01	M10145_01	M10146_01
2 Second Duplicate Secon Delay	B2	B3	B4
3 Second Dupicate Scan Delay	a second publicate scan peray	Delay	Delay
M10147_01	M10148_01	M10149_01	M10150_01
C1	C2	C3	C4
		Reader/Modem Command Settings	Version
M10151_01	M10152_01		M10157_01
D1 Reader Text Commands On	D2 Reader Text Commands Off - Default		D4 Clear All JavaScript Rules
M10137_01	M10136_01	Reset, Clear and Save Reader Settings	M10139_01
E1	E2		E4

Figure 14.17:DCR 80 Configuration Guide

DCR 80 Configuration Guide			
Clear All Stored Data and Images	Save All Reader Settings - Default	Reboot Reader	Intentionally Blank
M10138_02	M10159_01	M10296_01	
A1	A2	A3	A4

Figure 14.18:DCR 80 Configuration Guide