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Technical Note 069

QR code
# How to use it and what information is provided

QR stands for "Quick Response" and the code is used to provide a user with quick access to information. The 580 series and ACS880 drive families have a QR code generation feature which displays a QR code on the control panel. The 580 series is made up of the ACH580, ACQ580, and ACS580 series. The QR code contains drive identification information, fault event information, along with the VFD status, and counter parameters. The QR code can be read with a mobile device that has a QR code reader or preferably with the ABB service application, Drivetune. Drivetune is a free phone application providing a user-friendly interface for quick startup, drive tuning, commissioning, troubleshooting, and drive registration. This document explains how to generate the QR code on the VFD control panel, how to read and decipher the QR code using Drivetune, and what information is provided. Additionally, this document will show what information is displayed using a mobile device's QR code reader and how to manually decipher the information.

How to generate the QR code

The QR code is generated on the control panel by selecting the following:

Menu > System info > QR code

Refer to the control panel screen shots below for step-by-step instructions on how to generate the QR code. Note the example below is from an ACQ580 drive.
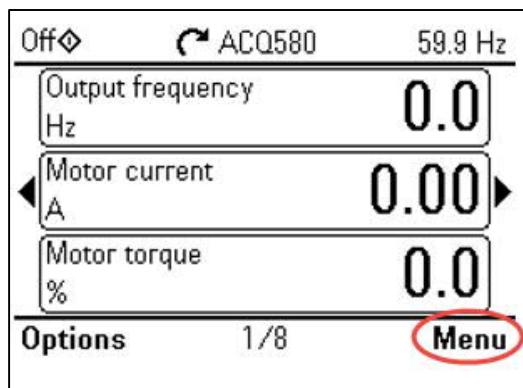
Open Menu- From the Home view, press the right softkey to open the menu. See Figure 1.

Figure 1
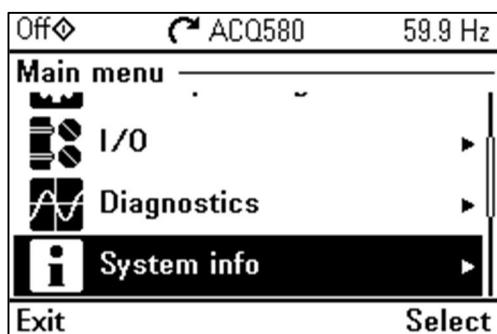
Navigate to System info- Press the down arrow key to navigate to System info and press the right softkey to select System info. See Figure 2.

Figure 2
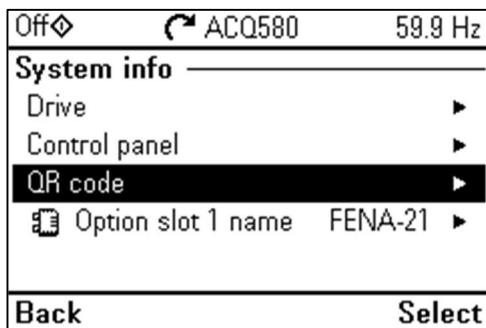
Figure 3

Navigate to QR code and press the right softkey to select the QR code. See Figure 3.
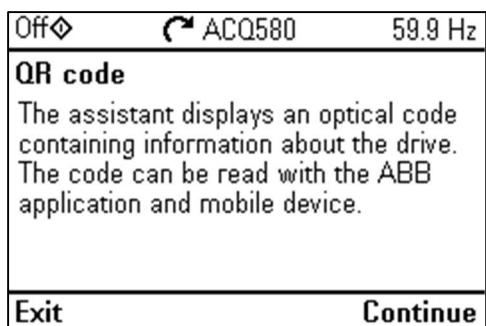

Figure 4

Generate QR code- Press the right softkey to generate the QR code. See Figure 4.
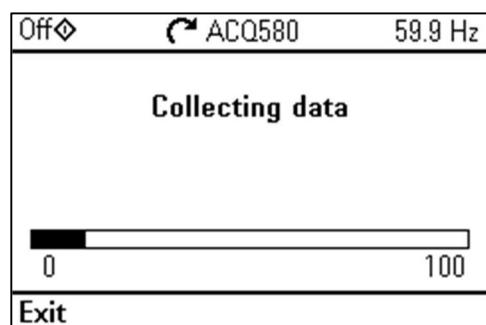

Figure 5

The control panel collects data and creates the code. See Figures 5.

Figure 6

View QR Code. See Figure 6. Note this QR code is used as the example later in this document.

How to read the QR code using mobile device QR code reader

Drivetune is a free ABB service application that can be downloaded on a mobile device and used to read the VFD generated QR code. Figures 7 and 8 show how to use Drivetune to decipher the QR code. Figures 10 and 11 show how the QR code can be used to find the serial number to register the drive.
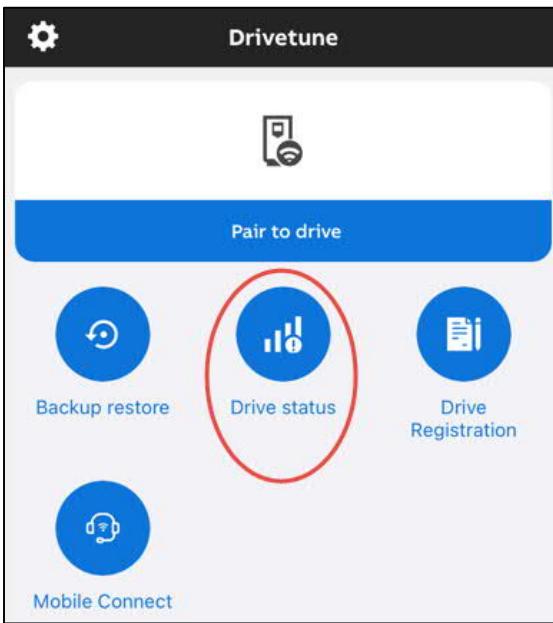
Figure 7

Once the QR code displays on the control panel, open Drivetune on a mobile device with access to a camera. Access the Scan QR code by clicking on the Drive status button. See Figure 7.
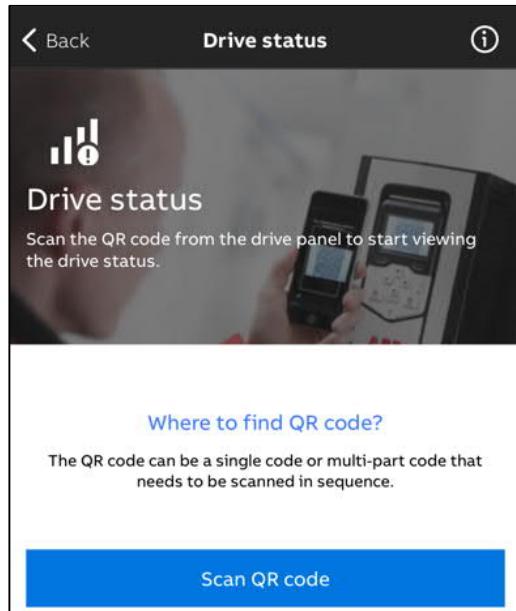
Figure 8

Click on the "Scan QR code" button. See Figure 8.
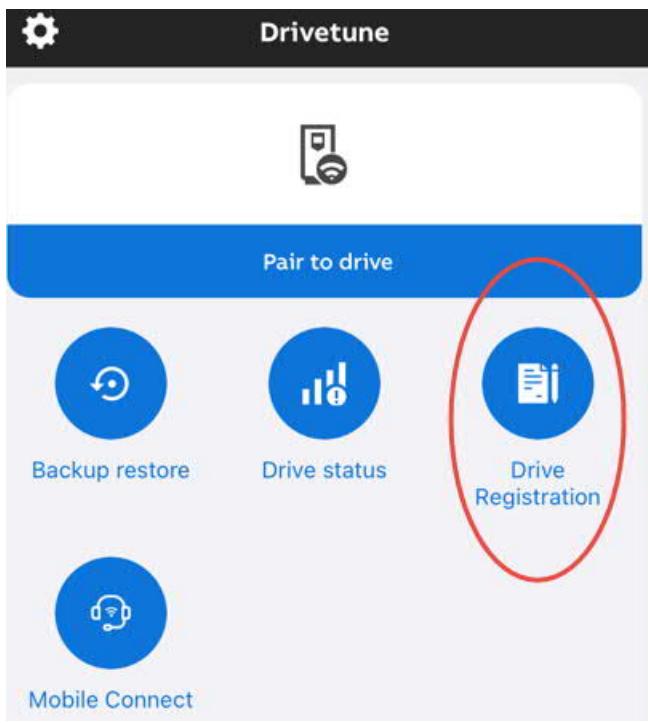
Figure 9
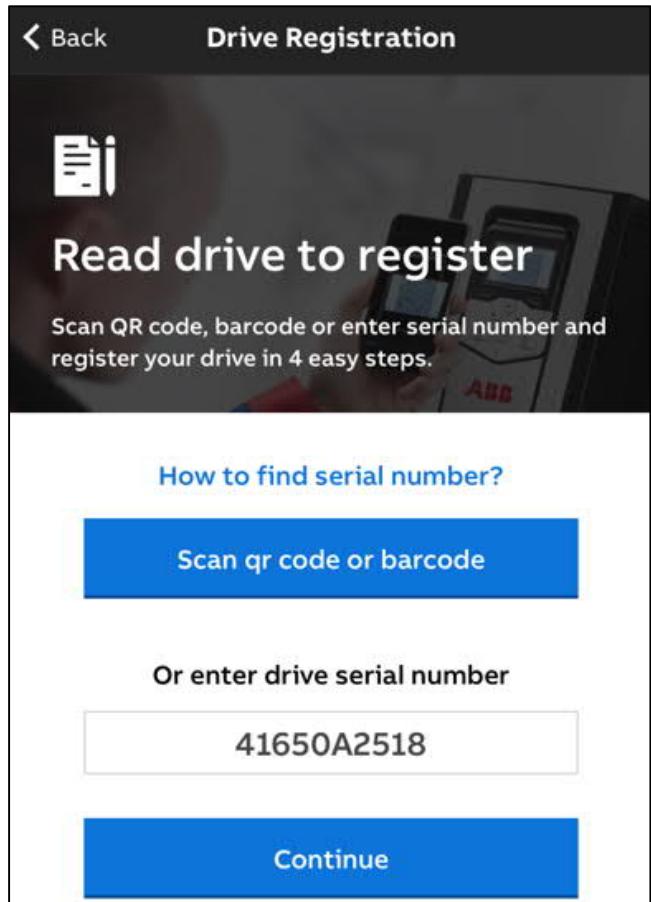
The drive can be registered by selecting the Drive Registration button. See Figure 9.

Figure 10

Click on the "Scan qr code or barcode" button. After reading the VFD generated QR code, the serial number will display. See Figure 10.

Information provided in the QR code from Drivetune

The QR code contains drive identification information, information on fault events, along with the VFD status, counter parameters, drive serial number, drive type, etc. After Drivetune has read the QR code, three screens will be available providing information on the drive. Press the Drive symbol and then the drive serial number, drive firmware version number, drive type, and control panel firmware version will display. See Figure 11.
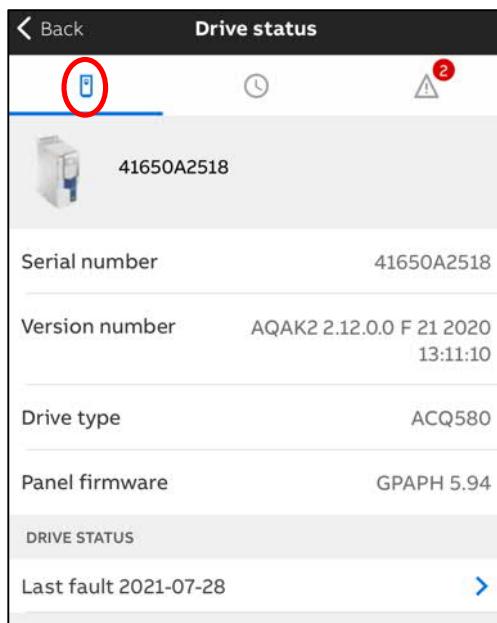

Figure 11

Clicking on " >" in Figure 11 leads to the Fault history page as shown in Figure 13.

Clicking on the clock symbol in Figure 12, the Lifetime counter, the fan conditions, and usage totals will display. Clicking on the triangle with the exclamation mark in it shown in Figure 13, the recent fault history will display along with the time the fault occurred. The time stamp when the QR code was generated is also displayed.
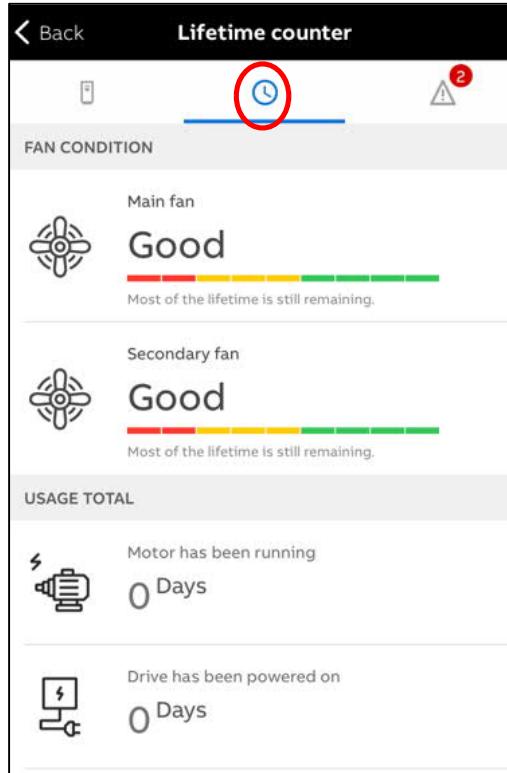

Figure 13
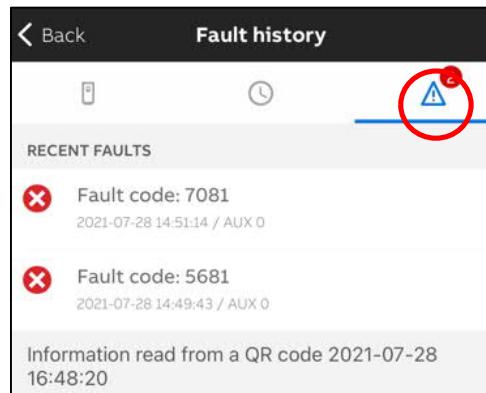
Figure 12

How to read the QR code using mobile device QR code reader

ABB recommends using Drivetune to read the QR code, however a generic QR reader can be used to decipher the information. Using the camera on a mobile device, scan the VFD generated QR code. See Figure 6. Similar information as shown in Figure 14 will display. This information will need to be decoded as displayed in Appendix A for the 580 series and Appendix B for the ACS880 drive. Some of the QR code information must also be converted from hexadecimal to a decimal format when only using a mobile device QR code reader.

/SN:41650A2518/PR:ACQ580/SW:AQAK2 2.12.0.0 F 21 2020 13:11:10/PW:GPAPH 5.94/TP:A/0723:8/2D13:3F3EF9DB/3313:63/3314:14/3316:1/6101:C/6306:3F99999A/6307:43660000/6 309:44AA0000/630A:3E999999/F0:64FF:0:3B51:D184/F1:7081:0:3B51:D0E2/F2:64FF:0:3B51:D097/F3:5 681:0:3B51:D087/0112:0/0113:0/0114:3E09853A/0501:0/0502:0/0504:0/0516:0/0529:0/052A:0/052D: 0/052E:0/060B:1033/0610:210D/0611:8/0612:0/0619:0/0624:0/2414:410C26C5/2415:4289DB2F/2416 :41920800/2417:3F88E75B/2418:3F9C087C/2419:3FE0B2FB/241A:3C6D8C18/241B:0/241C:0/241D:0/P N:1:1/SU:4AD1

Figure 14

Note a mobile device might recognize the QR code as a phone number instead of providing all the information in the QR code. See Figure 15. If this issue arises, then search for an online QR code reader with the mobile device's internet browser to read the QR code.
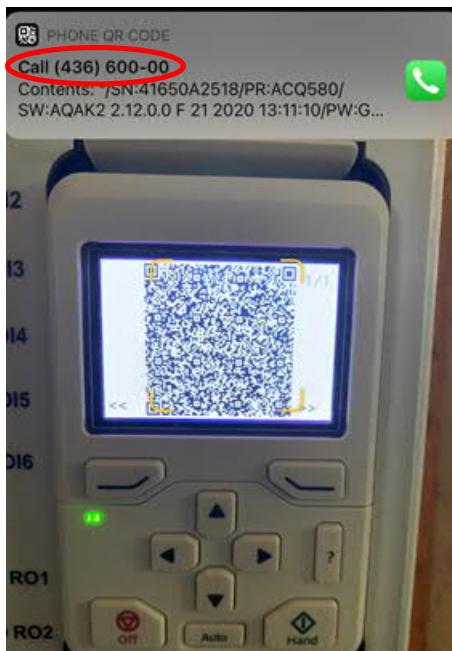
Figure 15

In summary, the 580 series and ACS880 drive control panels can generate a QR code that contains drive identification information, fault event information, along with the VFD status, counter parameters, and other information. Drivetune provides a user-friendly interface to decipher the QR code which is much easier than using another QR code reader which can be a tedious deciphering process. Drivetune can also be used for troubleshooting of the drive and to register a drive. Should a fault occur with the drive, a QR code can be generated through the control panel on the drive. The user can scan the QR code with Drivetune and then contact ABB technical support for troubleshooting recommendations.

Appendix A

Raw data for 580 series (ACQ580 used for this example)

/SN:41650A2518/PR:ACQ580/SW:AQAK2 2.12.0.0 F 21 2020 13:11:10/PW:GPAPH
5.94/TP:A/0723:8/2D13:3F3EF9DB/3313:63/3314:14/3316:1/6101:C/6306:3F99999A/6307:43660000/6309:44AA0000/6
30A:3E999999/F0:64FF:0:3B51:D184/F1:7081:0:3B51:D0E2/F2:64FF:0:3B51:D097/F3:5681:0:3B51:D087/0112:0/0113:0/01
14:3E09853A/0501:0/0502:0/0504:0/0516:0/0529:0/052a:0/052D:0/052E:0/060B:1033/0610:210D/0611:8/0612:0/061
9:0/0624:0/2414:410C26C5/2415:4289DB2F/2416:41920800/2417:3F88E75B/2418:3F9C087C/2419:3FE0B2FB/241A:3C6
D8C18/241B:0/241C:0/241D:0/PN:1:1/SU:4AD1

Table 1 has a breakdown of the code.

Table 1: ACQ580 QR code deciphered		
QR code content	Explanation	Definition
/SN:41650A2518	Serial number	Serial number of the drive when programmed. Otherwise ten zeros.
/ PR:ACQ580	Product type	ACQ580
/SW:AQAK2 2.12.0.0 F 21 2020 13:11:10	Firmware version	Defines the firmware version of the drive
/PW:GPAPH 5.94	Panel firmware version	Defines the firmware version of the control panel
/TP:A	Code type	Always A
/xx:yy	Parameter(s)	Lists all the user modified parameters. If nothing has been changed, there is none. Note all the parameters and faults must be converted from hexadecimal to decimal unless noted otherwise.
/0723:8	Drive Configuration Parameter	/0723:8 Parameter 07.35 8: Value is 8.
/2D13:3F3EF9DB	Comparison Power Parameter	/2D13: Parameter 45.19 3F3EF9DB: Value is ~ 0.75 (32-bit floating point).
/3313:63	T16 scale Parameter	/3313:63 Parameter 51.19 63: Value is 99
/3314:14	Telegram type Parameter	/3314:14 Parameter 51.20 14: Value is 20.
/3316:1	Map selection Parameter	/3316:1 Parameter 51.22 1: Value is 1.
/6101:C	Switching frequency reference Parameter	/6101:C Parameter 97.01 C: Value is 12.
/6306:3F99999A	Motor nominal current Parameter	/6306:3F99999A Parameter 99.06 3F99999A: Value is ~ 1.2 (32-bit floating point).
/6307:43660000	Motor nominal voltage Parameter	/6307:43660000 Parameter 99.07 43660000: Value is 230 (32-bit floating point).
/6309:44AA0000	Motor nominal speed Parameter	/6309:44AA0000 Parameter 99.09 44AA0000: Value is 1360 (32-bit floating point).
/630A:3E999999	Motor nominal power Parameter	/630A:3E999999 Parameter 99.10 3E999999: Value is ~0.30 (32-bit floating point).
/F0:64FF:0:3B51:D184	First fault	F0: index for the fault starting from zero 64FF: Fault reset 0: Aux code as it is 3B51: Days passed since 01/01/1980, now 15185 (07/28/2021) D184: Time converted as below: Hour: 53636 / 3600 = 14

		Minutes: (53636 – (14*3600)) / 60 = 3236 / 60 = 53
		Seconds: 3236 – (53*60) = 56
		Time: 07/28/2021 14:53:56
/F1:7081:0:3B51:D0E2	2nd fault	F1: index for the fault starting from zero 7081: Fault code – Panel port communication 0: Aux code as it is 3B51: Days passed since 01/01/1980, now 15185 (07/28/2021) D0E2: Time converted as below: Hour: 53474 / 3600 = 14 Minutes: (53474 – (14*3600)) / 60 = 3074 / 60 = 51 Seconds: 3074 – (51*60) = 14 Time: 07/28/2021 14:51:14
/F2:64FF:0:3B51:D097	3rd fault	F2: index for the fault starting from zero 64FF: Fault reset 0: Aux code as it is 3B51: Days passed since 01/01/1980, now 15185 (07/28/2021) D097: Time converted as below: Hour: 53399 / 3600 = 14 Minutes: (53399 – (14*3600)) / 60 = 2999 / 60 = 49 Seconds: 2999 – (49*60) = 59 Time: 07/28/2021 14:49:59
/F3:5681:0:3B51:D087	4th fault	F3: index for the fault starting from zero 5681: Fault code – PU communication 0: Aux code as it is 3B51: Days passed since 01/01/1980, now 15185 (07/28/2021) D087: Time converted as below: Hour: 53383 / 3600 = 14 Minutes: (53383 – (14*60)) / 60 = 2983 / 60 = 49 Seconds: 2983 – (49*60) = 43 Time: 07/28/2021 14:49:43
/0112:0	Inverter GWh counter Parameter	/0112: Parameter 01.18 0: Value is 0.
/0113:0	Inverter MWh counter Parameter	/0113: Parameter 01.19 0: Value is 0.
/0114:3E09853A	Inverter kWh counter Parameter	/0114: Parameter 01.20 3E09853A: Value is ~0.1 (32-bit floating point).
/0501:0	On-time counter Parameter	/0501: Parameter 05.01 0: Value is 0.
/0502:0	Run-time counter Parameter	/0502: Parameter 05.02 0: Value is 0.
/0504:0	Fan on-time counter Parameter	/0504: Parameter 05.04 0: Value is 0.
/0516:0	Diagnostic word 3 Parameter	/0516: Parameter 05.22 0: Value is 0
/0529:0	Not applicable	Parameter not available in the 580 series.

/052A:0	Not applicable	Parameter not available in the 580 series.
/052D:0	Not applicable	Parameter not available in the 580 series.
/052E:0	Not applicable	Parameter not available in the 580 series.
/060B:1033	Main status word Parameter	/060B: Parameter 06.11 1033: Value is 1033 shown in HEX.
/0610:210D	Drive status word 1 Parameter	/0610: Parameter 06.16 210D: Value is 0010 0001 0000 1101 (bit list).
/0611:8	Drive status word 2 Parameter	/0611: Parameter 06.17 8: Value is 0000 0000 0000 1000 (bit list).
/0612:0	Start inhibit status word Parameter	/0612: Parameter 06.18 0: Value is 0.
/0619:0	Not applicable	Parameter not available in the 580 series.
/0624:0	LSU status word Parameter	/0624: Parameter 06.36 0: Value is 0.
/2414:410C26C5	AL1 0 to 10% Parameter	/2414: Parameter 36.20 410C26C5: Value is ~8.75 (32-bit floating point).
/2415:4289DB2F	AL1 10 to 20% Parameter	/2415: Parameter 36.21 4289DB2F: Value is ~68.9 (32-bit floating point).
/2416:41920800	AL1 20 to 30% Parameter	/2416: Parameter 36.22 41920800: Value is ~18.25 (32-bit floating point).
/2417:3F88E75B	AL1 30 to 40% Parameter	/2417: Parameter 36.23 3F88E75B: Value is ~1.07 (32-bit floating point).
/2418:3F9C097C	AL1 40 to 50% Parameter	/2418: Parameter 36.24 3F9C097C: Value is ~1.22 (32-bit floating point).
/2419:3FE0B2FB	AL1 50 to 60% Parameter	/2419: Parameter 36.25 3FE082FB: Value is ~1.76 (32-bit floating point).
/241A:3C6D8C18	AL1 60 to 70% Parameter	/241A: Parameter 36.26 3C6D8C18: Value is ~0.01 (32-bit floating point).
/241B:0	AL1 70 to 80% Parameter	/241B: Parameter 36.27 0: Value is 0.
/241C:0	AL1 80 to 90% Parameter	/241C: Parameter 36.28 0: Value is 0.
/241D:0	AL1 over 90% Parameter	/241D: Parameter 36.29 0: Value is 0.
/PN:1:1	Page number	First number is the current QR code being read and the second is total number of QR codes in a multi-part QR code.
/SU:4AD1	CRC	16-bit modbus CRC calculated from the code

Appendix B

Raw data for ACS880

/SN:0000000000/PR:ACS880/SW:AINF6 1.82.255.3 J 8 2014 10:20:/PW:GPAPI
4.61/TP:A/F0:5681:6:3140:993E/F1:64FF:0:3140:993D/F2:64A1:C:3140:97DB/0112:0/0113:0/0114:0/0501:0/0502:0/0504:
0/0516:800/0529:0/052A:0/052D:0/052E:0/060B:2F8/0610:402/0611:8/0612:28/0619:0/0624:0/2414:0/2415:0/2416:0
/2417:0/2418:0/2419:0/241A:0/241B:0/241C:0/241D:42C80001/PN:1:1/8C23

Table 2 has a breakdown of the code.

Table 2: ACS880 QR code deciphered		
QR code content	Explanation	Definition
/SN:0000000000	Serial number	Serial number of the drive when programmed. Otherwise ten zeros.
/PR:ACS880	Product type	ACS880
/SW:AINF6 1.82.255.3 J 8 2014 10:20:	Firmware version	Defines the firmware version of the drive
/PW:GPAPI 4.61	Panel firmware version	Defines the firmware version of the control panel
/TP:A	Code type	Always A
/xx:yy	Parameter(s)	Lists all the user modified parameters. If nothing has been changed, there is none. Note all the parameters and faults must be converted from hexadecimal to decimal unless noted otherwise
/F0:5681:6:3140:993E	First fault	F0: index for the fault starting from zero 5681: Fault code – PU communication 6: Aux code as it is 3140: Days passed since 01/01/1980, now 12608 (07/08/2014) 993E: Time converted as below: Hour: 39230 / 3600 = 10 Minutes: (39230 – (3600*10)) / 60 = 3230 / 60 = 53 Seconds: 3230 – (53*60) = 50 Time: 07/08/2014 10:53:50
/F1:64FF:0:3140:993D	2nd fault	F1: index for the fault starting from zero 64FF: Fault reset 0: Aux code as it is 3140: Days passed since 01/01/1980, now 12608 (07/08/2014) 993D: Time converted as below: Hour: 39229 / 3600 = 10 Minutes: (39229 – (3600*10)) / 60 = 3229 / 60 = 53 Seconds: 3229 – 53*60 = 49 Time: 07/08/2014 10:53:49
/F2:64A1:C:3140:97DB	3rd fault	F2: index for the fault starting from zero 64A1: Fault code – Internal file load C: Aux code as it is 3140: Days passed since 01/01/1980, now 12608 (07/08/2014) 97DB: Time converted as below: Hour: 38875 / 3600 = 10 Minutes: (38875 – (3600*10)) / 60 = 2875 / 60 = 47

		Seconds: 2875 − 47*60 = 55
		Time: 07/08/2014 10:47:55
/0112:0	Inverter GWh counter Parameter	/0112: Parameter 01.18 0: Value is 0.
/0113:0	Inverter MWh counter Parameter	/0113: Parameter 01.19 0: Value is 0.
/0114:0	Inverter kWh counter Parameter	/0114: Parameter 01.20 0: Value is 0.
/0501:0	On-time counter Parameter	/0501: Parameter 05.01 0: Value is 0.
/0502:0	Run-time counter Parameter	/0502: Parameter 05.02 0: Value is 0.
/0504:0	Fan on-time counter Parameter	/0504: Parameter 05.04 0: Value is 0.
/0516:800	Diagnostic word 3 Parameter	/0516: Parameter 05.22 800: Value is 0000 1000 0000 0000 (bit list).
/0529:0	Main fan service counter Parameter	/0529: Parameter 05.41 0: Value is 0.
/052A:0	Aux. fan service counter Parameter	/052A: Parameter 05.42 0: Value is 0.
/052D:0	Capacitor service counter Parameter	/052D: Parameter 05.45 0: Value is 0.
/052E:0	IGBT service counter Parameter	/052E: Parameter 05.46 0: Value is 0.
/060B:2F8	Main status word Parameter	/060B: Parameter 06.11 2F8: Value is 2F8 (actually bit list, but shown in HEX).
/0610:402	Drive status word 1 Parameter	/0610: Parameter 06.16 402: Value is 0000 0100 0000 0010 (bit list).
/0611:8	Drive status word 2 Parameter	/0611: Parameter 06.17 8: Value is 0000 0000 0000 1000 (bit list).
/0612:28	Start inhibit status word Parameter	/0612: Parameter 06.18 28: Value is 0000 0000 0010 1000 (bit list).
/0619:0	Drive inhibit status word 2 Parameter	/0619: Parameter 06.25 0: Value is 0.
/0624:0	LSU status word Parameter	/0624: Parameter 06.36 0: Value is 0.
/2414:0	AL1 0 to 10% Parameter	/2414: Parameter 36.20 0: Value is 0.
/2415:0	AL1 10 to 20% Parameter	/2415: Parameter 36.21 0: Value is 0.
/2416:0	AL1 20 to 30% Parameter	/2416: Parameter 36.22 0: Value is 0.
/2417:0	AL1 30 to 40% Parameter	/2417: Parameter 36.23 0: Value is 0.
/2418:0	AL1 40 to 50% Parameter	/2418: Parameter 36.24 0: Value is 0.
/2419:0	AL1 50 to 60% Parameter	/2419: Parameter 36.25 0: Value is 0.
/241A:0	AL1 60 to 70%	/241A: Parameter 36.26

	Parameter	0: Value is 0.
/241B:0	AL1 70 to 80% Parameter	/241B: Parameter 36.27 0: Value is 0.
/241C:0	AL1 80 to 90% Parameter	/241C: Parameter 36.28 0: Value is 0.
/241D:42C80001	AL1 over 90% Parameter	/241D: Parameter 36.29 42C80001: Value is ~100 (32-bit floating point).
/PN:1:1	Page number	First number is the current QR code being read and the second is total number of QR codes in a multi-part QR code.
/8C23	CRC	16-bit modbus CRC calculated from the code