

ICS-200 Series Startup Diagnostics Messages and the Disconnect Messages

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Date	Revision	Author	Comment
10/29/1997	1.0a	Jason France	First Draft
11/13/1997	1.1a	Jason France	made changes to Table 5-2 for software version 1.2.16, the column "IS"
11/20/1997	1.2a	Jason France	changed error ID's to start from 0 in Table 2-4
1/23/1998	1.3a	Jason France	changes to Table 5-1 for software version 1.2.17, include total kWhrs as part of the error log, added section 4 regarding usage information
3/30/1998	1.0b	Jason France	Changes from first presentation to Table 2-4, added comments to the data log 5 Recording the Error Log for Review

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1. About This Document

1.1. Scope

A summary of how to access, record, and interpret the ICS-200 verbal diagnostics messages from the front panel without the need for the FICS system. Information about the disconnect messages is also included.

1.2. Comments

The ICS-200 includes an internal diagnostics data logging system which is maintained by the backup battery. Often times, problems can be determined by analyzing this data log and a service visit is not required.

It is possible for the customer to force the ICS-200 to announce the error list over the phone for maintenance personnel to record in the ledgers on Page 10. Therefore, page 10, should be photocopied to be used for recording error information in the future.

2. The Disconnect Messages

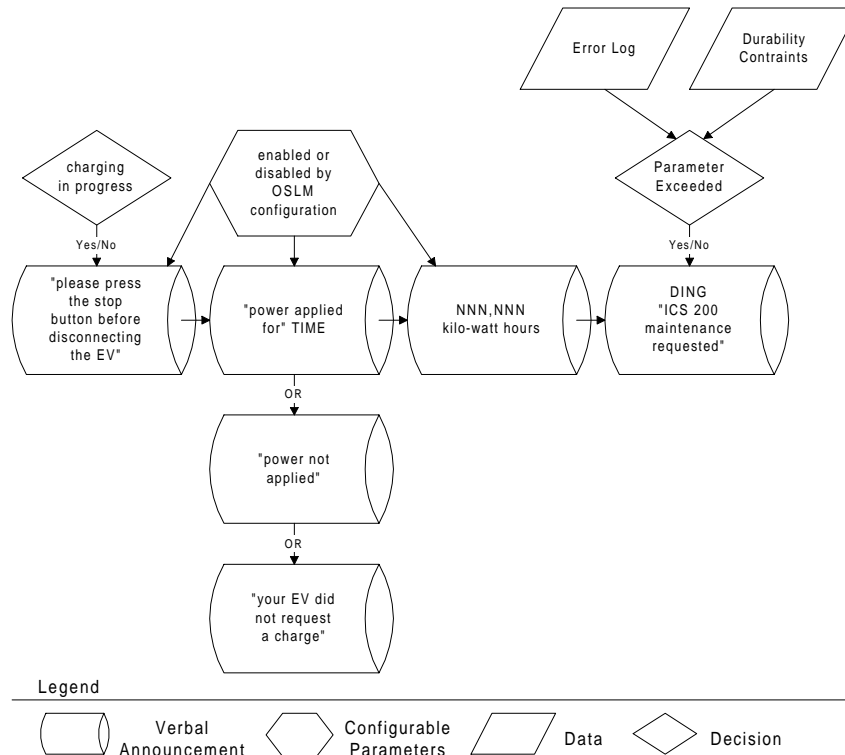
The disconnect messages are a series of messages which may be announced to the customer for informational purposes. Table 2-1 lists the circumstances under which the disconnect message sequence will be announced. Figure 2-1 is an illustration of the individual disconnect message components as described in sections 2.1 to 2.4.

Some of the messages may be enabled or disabled by the On-Site and Load Management, (OSLM), parameter block using the Magma software.

Table 2-1 Methods of Retrieving Disconnect Message

1. pressing the stop button whenever the ready or charging designator is lit
2. disconnecting the EV whenever and the ready or charging designator is lit
3. press then immediately release the stop button when all designators are unlit

Figure 2-1 Illustration of the Disconnect Message's Components



2.1. Stop Before Disconnect

Minimizing the arcing of EV power carrying contacts, when the coupling is disengaged, will increase the longevity of the EV connector and receptacle.

If possible, by use of the pilot signal, the HBCD will detect when the connector is being pulled from the EV and will de-energize the EV isolation contactor. The contactor's contacts will arc instead of the EV connector's contacts. This is desirable because the EV isolation contactor is more durable and less expensive to replace than the EV connector.

Minimizing the potential of this problem is accomplished by reminding the customer to press the stop button before disconnecting the EV. If only the charging designator is lit, this message is announced.

In the case of some connectors, such as the Yazaki and ODU, the unlatching trigger will automatically open the pilot signal, and therefore, perform the same function as pressing the stop button. It is more friendly to the customer not to announce this message for these connectors. The message is enabled or disabled by the OSLM parameter block, usually based on the type of connector.

Table 2-2 Factory Configuration for Stop Message Based on Connector Type

Connector Type	Enabled/Disabled from Factory
Yazaki	disabled
ODU	disabled
Avcon, American 60 Amps	enabled
Avcon, European 40 Amps	enabled

2.2. Power Applied

There are three power applied messages. Announcement of these messages can collectively be enabled or disabled by the OSLM parameter block.

1. “power applied for” TIME
The ICS-200 keeps track of the amount of time the contactor is closed. The time accumulation does not differentiate between charging and maintenance modes. The time is spoken as the most significant 2 digits of time. For example, 00:05:48 would be announced as 5 minutes 48 seconds. 02:34:25 would be announced as 2 hours 34 minutes.
2. “power not applied”
If the contactor is never closed and no charging mode is entered, “power not applied” will be announced. Usually this is the result of two different action sequences. In the first case, the EV is connected, the ready designator is lit, then the EV is immediately disconnected. In the other case, the maintenance mode is disabled, and no charging mode is entered before the EV is disconnected.
3. “your EV did not request a charge”
If a charging or maintenance cycle is entered, but the EV never requests a charge by closing the S2 switch, then the EV is disconnected, “your EV did not request a charge” will be announced.

2.3. Kilo-Watt Hours

Total power is continuously accumulated as an absolute value in non-volatile memory. A maximum of 340,000,000Whrs can be accumulated, after which the value will roll around to 0Whrs.

Power is calculated using the average of the last minute’s EV current rating and the OSLM nominal voltage setting. This calculation is not intended to be instantaneously accurate, and therefore, is only an estimated value.

The power message is enabled or disabled by the OSLM parameter block. Regardless of message enabled configuration, the value is always accumulated and can be accessed from Magma.

2.4. Maintenance Requested

The maintenance requested message may be announced whenever a durability constraint or error log value has been exceeded. The announcement of this message is intended to encourage the customer to call for service and does not disable charging.

2.4.1. Durability Constraints

The ICS-200 includes operational functions to minimize customer inconvenience from failures as a result of wear from normal use. Durability constraints are system constants which hold information

about a specific piece of hardware’s functional life expectancy. There are two components to the durability constraints, the maximum value, and the current count. The maximum value is stored in the OSLM parameter block, and the current count is stored in battery backed RAM.

Table 2-3 lists the maximum allowable counts. When any of these values has been exceeded as a result of use, the maintenance requested message will be announced.

Table 2-3 Maximum Durability Constraints

Announcement from Table 5-1	Durability Constraint	Maximum Value
“connection”	Charging Cycles	100,000
“charged”	EV Connections	5,000
“reduce cable tension”	Excessive Strains	4,000

2.4.2. Error Log

A count of all errors which occur during operation is kept in battery backed RAM. Table 2-4 list the maximum allowable number of errors. When any of these counts has been exceeded as a result of malfunctions, the maintenance requested message will be announced.

Table 2-4 Error Log Maximum Values

Number	Error	Maximum Value
00	Contactors Stuck Open	5
01	Contactors Stuck Closed	5
02	Cable Pull Free	5
03	Pilot Positive 12V	5
04	Pilot Negative 12V	5
05	Configuration WDT	20
06	GFCI Circuitry	20
07	Dual Contactor Driver	5
08	RTC Not Counting	none
09	No WDT Resets	5
10	GFCI Trips	none
11	Pilot Dead Band	20
12	Venting Fan	none
13	EV Excessive Current	none
14	Service Ground Missing	none
15	Incorrect Time or Date	none

3. Announcement of Error List

The ICS-200 can announce important errors from the error log and the current count for the durability constraints. This is useful for information gathering or determining which parameter is causing the announcement of the maintenance requested message as described in section 2.4.

Table 3-1 Summary for Accessing the Error Announcement

1. Restart the ICS-200
2. Hold both the CHARGE NOW and STOP buttons
3. Listen to error announcement, durability constraints and non-zero error logs
4. Optionally clear the error log
5. Section 4 has a ledger for recording the information

3.1. Restart the ICS-200

The announcement only occurs during a system restart. There are four ways to restart the ICS-200, as listed in Table 3-2.

Table 3-2 How to Restart the ICS-200

1. Use the ICS reset module, plug into FICS port, press and release the button
2. Use Magma Windows software, plug into FICS port, choose EDIT=>Reset ICS
3. Turn off circuit breaker, wait for 10 seconds, turn on circuit breaker
4. Set the date forward by 1 month, then wait 1 minute, this will force periodic testing to occur

Restart mode can be identified by the lit service designator, or cycling of all four designators.

3.2. Hold Both Buttons

To access the error announcement, press and hold both the CHARGE NOW and STOP buttons while performing the restart function. Continue holding both buttons until there is an announcement. Note that for step 3 in Table 3-2, this will probably require two people, and for step 4, it will take up to one minute for the periodic testing to finish.

After restart, both buttons must be held continuously until there is an announcement.

3.3. Listen to Error Announcement

First the three durability constraints' type and count are announced. Record the count in Table 5-1. If a count exceeds the corresponding maximum value from Table 2-3, then the maintenance requested message is spoken during the disconnect message sequence.

Immediately afterwards, failures in the error log with *non-zero* counts will be announced. This includes the failure number, count, and last occurrence date. Record the three pieces of information in Table 5-2. If a count exceeds the corresponding maximum value from Table 2-4, then the maintenance requested message is spoken during the disconnect message sequence.

If there are no errors in the log, then "zero failure since" DATE will be announced. The date is taken from the first error entry's date. DATE will be set to 00/00/1900 if the error log was cleared due to battery backed RAM corruption. DATE will be set to a real date if the error log was cleared by personnel.

3.4. Clear the Error Log

After announcement of the durability constraints and error log, "Press stop to cancel set failure to zero" will be announced.

Press the STOP button to continue normal operation without clearing the error log.

Press CHARGE NOW to continue. "Press stop to cancel set failure to zero" will be announcement again. Press STOP to abort. Press CHARGE NOW again to clear the error log.

The durability constraint counts cannot be cleared from the front panel.

4. Usage Information

The ICS-200 maintains usage information as part of its basic platform. Usage information can be incorporated into a staged public installation strategy, allowing for progression of units in the field that caters to actual use. Installation of charging stations in area's where they will not be used is a waste of funds.

Usage information is normally recorded using a standard metering system. However, the total kilo-watt hours only provides part of the desired information.

The ICS-200 uses two parameters for characterizing usage information, number of EV charge cycles and total kilo-watt hours. Both of these parameters are available from the front panel with the use of the reset module, see section 3.

By using two parameters, the use charging station is capable of characterizing use information with greater detail than even using a separate meter for each charging station. This characterization is illustrated in Table 2-4. Because the two parameters are recorded by the ICS-200 internally, great cost savings can be obtained without sacrificing usage data gathering. This is because only one power meter is needed for many charging stations.

Decisions regarding new public installations can be justified by gathering information from a number of charging stations, and comparing the two usage parameters. Obviously, locations with stations which fall into the high rate of charge and have the most customers are most desirable for additional investment.

Table 4-1 Usage Information

parameters→ ↓	kWHrs High	kWHrs Low
Charge Cycles High	many customers high rate of charge	many customers short use time
Charge Cycles Low	few customers long use time	little use

5. Recording the Error Log for Review

Use the following tables to record the error information from the ICS-200.

Table 5-1 First Message Sequence

Durability Constraint	Count
“kilo-watt hours”	
“connection”	
“charged”	
“reduce cable tension”	

Table 5-2 Second Message Sequence

	Failure Number		Count		Month	Day	Year
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			
“failure”		“is”		“at”			

To Clear The Log

1. “*Press stop to cancel set failure to zero*” announced.
2. Press the STOP button to continue normal operation without clearing the error log.
3. Press CHARGE NOW to continue.
4. “*Press stop to cancel set failure to zero*” will be announcement again.
5. Press STOP to abort.
6. Press CHARGE NOW again to clear the error log.

6. Clearing Durability Constraints

The durability constraints can only be cleared using the Magma software for windows. Follow the procedures listed in Table 6-1 to clear the durability constraints.

Table 6-1 Clearing Durability Constraints

1. connect the FICS
2. run Magma
3. select the correct COM port, Settings => Comport
4. Go to NVRAM edit mode, Edit => NVRAM Parameters
5. Select the Download button
6. Wait for Magma to retrieve the current settings from the ICS-200
7. Observe the three durability constraints in the lower left of the edit window
8. Observe the durability constraints are grayed out
9. A file by the name of REMERSON.DAT must be in the Magma working directory
10. Press CNTRL-SHIFT and the right mouse button
11. The durability constraints can now be edited
12. Modify only the required durability constraint
13. Select the Upload button
14. Wait for Magma to upload the new settings