MODEL 2G600
Automatic Sample Degaussing System

User's Manual and Technical Reference

October 2002

CAUTION: When ramping to high field values, particularly those near the maximum coil capacity, it is important the allow the coil to remain on for only a short time period (<10 seconds) because of coil heating. The system has enough power capacity to raise the coil temperature high enough to damage the coil (T >160°C) if left on continuously. In computer mode, if the ramp cycle command is used, the system will automatically ramp down if tracking is not achieved.

2.3 Computer Interface

2.3.1 General features

The degaussing system is equipped with a computer interface that enables automatic degaussing under the control of an external computer. The interface is a serial RS232 data link. Connection to the degaussing system is made through a 25-pin D female connector. Signals to the degausser from an external computer are on pin 2; replies from the degausser are on pin 3. Pin 7 is ground. No handshaking protocol is used. The communication baud rate is 1200 and the data word consists of 8 bits with no parity and one stop bit.

Because the data link is implemented in the degausser by a single board computer running a small basic program, the response time of the degausser to commands is slow. For instance, after sending a command DCA1000 (degausser configure amplitude 1000), the degausser will need about one second to process this information before it can accept another command. Suitable wait loops will have to be used in the external computer code to prevent unreliable communications.

2.3.2 Command response protocol

Commands to the degausser and responses all take the form of strings of letters or numbers (ASCII strings). Commands to the degausser must all be preceded by the ASCII letter D. Commands are of three types:

    1. Configure
    2. Execute ramp
    3. Send status

Configure commands set up the system parameters. These commands are denoted by the letter C, e.g., DCCS (Degausser Configure Coil X). Execute ramp commands are denoted by the letter E and cause a ramping of the field up or down or in an up and down (cycle) fashion. The send status command (DSS) causes the degausser to send back its status. A detailed listing of all degausser commands is included at the end of this section.

When the degausser is commanded to send its status, it returns a character string in the following format:

    S! R# D# C& A###.#

where
! specifies system status and can be Z = zero, T = tracking or ? = unknown
specifies ramp rate parameter and can be any of the following numbers: 3, 5, 7, 9
specifies delay parameter and can be any number between 1 and 9
& specifies active coil and can be X or Y or Z
###.# specifies amplitude and can be any number between 000.0 and 199.9

All commands to the degausser must terminate with a carriage return (ASCII character 13). A line feed should not be sent along with the carriage return. All responses from the degausser are also terminated with a carriage return.

When execute ramp commands are issued, the degausser will automatically answer when the commanded status is received. When a DERU (Degausser Execute Ramp Up) command is given, the system sends back a T when the field is tracking. If tracking does not occur, TRACK ERROR is sent back.

When a DERD (Degausser Execute Ramp Down) command is sent, the system sends back a Z when the field is at zero. If ramp down is unsuccessful, the degausser sends

back a ZERO ERROR.

When a DERC (Degausser Execute Ramp Cycle) command is given, the degausser sends back DONE when the cycle is complete. If cycle is unsuccessful, the system sends back TRACK ERROR.

2.3.3 Synopsis of degausser protocol 1200 Baud, 8 bits, no parity, one stop bit

DCC
        Degausser Configure Coil (X, Y, Z) default axis Z
        (see note 1 below)

DCA
        Degausser Configure Amplitude (0000->3000) default amp 0000
        (see note 2 below)

DCD
        Degausser Configure Delay (1-9 seconds) default delay 1 second

DCR
        Degausser Configure Ramp (3, 5, 7, 9) default 3

DERU
        Degausser Execute Ramp Up

DERD
        Degausser Execute Ramp Down

DERC
        Degausser Execute Ramp Cycle

To get status, type:

DSS
        Degausser Send Status

Reply from controller:

S! R# D# C& A###.#

Status (!)   Z=Zero, T=Tracking, ?=Unknown
Ramp (#)   3, 5, 7, 9
Delay (#)   1 to 9 seconds: Used only in Ramp Cycle Mode
Coil (&)   X=X Axis, Y=Y Axis, Z=Z Axis, ?=Unknown
Amplitude (###.#) 00 to 3000

Note 1:
        When the tracking light in on, the command to configure coil axis will
        be ignored. There are two circumstances that cause the tracking light to
        turn on:

                1. Coil is energized and tracking
                2. Coil amplitude is set at zero (computer or manual) mode

        The second condition is the default condition on power up. To change
        axis after power up, you must first configure the amplitude to be
        nonzero.

Note 2:
        Amplitude commands must contain 4 digits, e.g., if an amplifier of 10
        Gauss is required, use the command DCA 0010.