Industrial communication solutions for Windows

XGEDFF Driver Manual

General Electric DFF Relay Protocol Driver

Contents

XGEDFF technical specifications

General information

XGEDFF driver communicates with General Electric DFF 1000 3C2 Digital Frequency Relays.

Command list

Read Status

Description of this command:
This command reads the relay status.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1-39
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
30
Values that are returned:
Text in PointText (0) = Arranque F1
Text in PointText (1) = Arranque F2
Text in PointText (2) = Arranque F3
Text in PointText (3) = Arranque F4
Text in PointText (4) = Arranque F5
Text in PointText (5) = Arranque F6
Text in PointText (6) = Arranque F7
Text in PointText (7) = Arranque F8
Text in PointText (8) = Disparo F1
Text in PointText (9) = Disparo F2
Text in PointText (10) = Disparo F3
Text in PointText (11) = Disparo F4
Text in PointText (12) = Disparo F5
Text in PointText (13) = Disparo F6
Text in PointText (14) = Disparo F7
Text in PointText (15) = Disparo F8
Text in PointText (16) = Arranque 27
Text in PointText (17) = Arranque 59
Text in PointText (18) = Disparo 27
Text in PointText (19) = Disparo 59
Text in PointText (20) = Alarma E2PROM paralelo
Text in PointText (21) = Alarma E2PROM serie
Text in PointText (22) = Fuera de servicio
Text in PointText (23) = Ajustes generales defecto
Text in PointText (24) = Ajustes tabla 1 defecto
Text in PointText (25) = Ajustes tabla 2 defecto
Text in PointText (26) = Ajustes tabla 3 defecto
Text in PointText (27) = Contacto de disparo
Text in PointText (28) = Tabla activa 1
Text in PointText (29) = Tabla activa 2
Text in PointText (30) = Tabla activa 3
Text in PointText (31) = Disparos no permitidos
Text in PointText (32) = Hay sucesos
Text in PointText (33) = Conexión frontal (0=NO,1=SI)
Text in PointText (34) = Alarma Fecha/hora
Text in PointText (35) = Alarma EEPROM serie

Text in PointText (36) = Ajustes del sistema (0=USUARIO,1=DEFECTO)
Text in PointText (37) = Enlace protección (0=SI,1=NO)
Text in PointText (38) = Enlace IRIGB (0=SI,1=NO)

Read Inputs and Outputs

Description of this command:
This command reads the relay I/O.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1-42
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
31
Values that are returned:
Text in PointText (0) = EP01
Text in PointText (1) = EP02
Text in PointText (2) = EP03
Text in PointText (3) = EP04
Text in PointText (4) = EP05
Text in PointText (5) = EP06
Text in PointText (6) = EP07
Text in PointText (7) = EP08
Text in PointText (8) = EP09
Text in PointText (9) = EP10
Text in PointText (10) = EP11
Text in PointText (11) = EP12
Text in PointText (12) = EP13
Text in PointText (13) = EP14
Text in PointText (14) = SP01
Text in PointText (15) = SP02
Text in PointText (16) = SP03
Text in PointText (17) = SP04
Text in PointText (18) = SP05
Text in PointText (19) = SP06
Text in PointText (20) = SP07
Text in PointText (21) = SP08
Text in PointText (22) = SP09
Text in PointText (23) = SP10
Text in PointText (24) = SP11
Text in PointText (25) = SP12
Text in PointText (26) = SP13
Text in PointText (27) = SP14
Text in PointText (28) = SP15
Text in PointText (29) = SP16
Text in PointText (30) = SP17
Text in PointText (31) = SP18
Text in PointText (32) = SP19
Text in PointText (33) = SP20
Text in PointText (34) = SP21
Text in PointText (35) = SP22
Text in PointText (36) = SP23
Text in PointText (37) = SP24
Text in PointText (38) = SP25
Text in PointText (39) = SP26
Text in PointText (40) = SP27
Text in PointText (41) = SP28

Read Measurements

Description of this command:
This command reads the relay measurements.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1-6
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
32
Values that are returned:
Value in PointValue (0) = Va (kV)
Value in PointValue (1) = Vb (kV)
Value in PointValue (2) = Vc (kV)
Value in PointValue (3) = Vn (kV)
Value in PointValue (4) = Frequency (Hz)
Value in PointValue (5) = dF/dT (Hz/seg)

Read Relay Model Number

Description of this command:
This command reads relay model.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
33
Values that are returned:
Text in PointText (0) = Model

Read Relay Location

Description of this command:
This command reads relay location.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
34
Values that are returned:
Text in PointText (0) = Location

Download Events

Description of this command:
This command reads all the events available in the relay memory. Events are stored in a specified file in the local machine. Events can be removed from the relay memory after download.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
35

Meaning of the DriverP2 parameter:
Not used
Meaning of the DriverP3 parameter:
Indicates the format for returned dates:
0 = Use English format (MM/DD/YYYY hh:mm:ss.000)
1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)
Meaning of the DriverP4 parameter:
Not used
Meaning of the DriverP5 parameter:
Indicates if additional information must be included in the event records:
0 = No additional information (only date, time and event cause)
1 = Show complete event informacion (adds current values, input status, etc)
Meaning of the DriverP6 parameter:
Indicates the path where the event file will be generated. If this property is empty, the local driver folder is used by default.
Meaning of the DriverP9 parameter:
Filename for event file. If empty, 'XGEDFF_Events.Relayxxx.txt' will be used, where xxx is the device unit address.
Values that are returned:
Value in PointValue (0) = Indicates how many events have been extracted.
Text in PointText (0) = Description of last event extracted (empty if no events extracted).

Read Date And Time

Description of this command:
This command reads the current relay date and time.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1-7
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
36
Meaning of the DriverP3 parameter:
Indicates the format for returned dates:
0 = Use English format (MM/DD/YYYY hh:mm:ss.000)
1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)
Values that are returned:
Text in PointText (0) = Date And Time

Synchronize

Description of this command:
Sets a new time in the relay using the PC clock date and time.
This command follows this procedure:
- Reads the current date and time from the relay
- Compares the received relay date and time (plus the estimated reading delay indicated in DriverP5) against the current PC clock date and time.
- Based on the allowed time difference given in the P2 parameter, the driver determines if a synchronization is neccesary,
- If a synchronization is required, the driver broadcasts the current PC clock date and time (plus the estimated transmission delay indicated in DriverP6) to all relays.
- After synchronization, reads back the new date and time from the relay.
- Compares the received relay date and time (plus the estimated reading delay indicated in DriverP5) against the current PC clock date and time.
- Based on the allowed time difference given in the P2 parameter, the driver determines if the synchronization was successfull or not.
- Returns status or error information about the synchronization result.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1-9

Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
37
Meaning of the DriverP2 parameter:
Allowed difference, in milliseconds.
Meaning of the DriverP3 parameter:
Indicates the format for returned dates:
0 = Use English format (MM/DD/YYYY hh:mm:ss.000)
1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)
Meaning of the DriverP4 parameter:
Delay between a synchronization telegram is sent and the current relay clock is checked, in milliseconds (0-10000ms, suggested is 500ms or more).
Meaning of the DriverP5 parameter:
Estimated communication delay when reading data from the relay, in milliseconds. This delay has to do with the communication link and compensates the elapsed time between the moment the relay transmits the telegram with its date and time and the moment the telegram is received and processed by the driver.
Meaning of the DriverP6 parameter:
Estimated communication delay when transmitting data to the relay, in milliseconds. This delay has to do with the communication link and compensates the elapsed time between the moment the driver transmits the telegram with the PC clock date and time to the relay and the moment the telegram is received and processed by the relay.
Meaning of the DriverP7 parameter:
Not used
Meaning of the DriverP8 parameter:
Not used
Meaning of the DriverP9 parameter:
Not used
Values that are returned:
Value in PointValue (0) = 0 if synchronization not needed, 1 if synchronized OK, 2 if error synchronizing.
Value in PointValue (3) = Time difference before synchronization in milliseconds.
Value in PointValue (7) = Time difference after synchronization in milliseconds (also returns previous difference if synchronization was not needed).
Text in PointText (0) = Returned status or error message.
Text in PointText (1) = PC clock date and time obtained when starting communication.
Text in PointText (2) = Relay date and time received when starting communication.
Text in PointText (3) = Relay date and time received when starting communication, corrected with reading delay.
Text in PointText (4) = PC clock date and time obtained before synchronization (empty if synchronization was not needed).
Text in PointText (5) = Actual PC clock date and time used for synchronization, corrected with transmitting delay (empty if synchronization was not needed).
Text in PointText (6) = PC clock date and time obtained after synchronization (empty if synchronization was not needed).
Text in PointText (7) = Relay date and time received after synchronization (empty if synchronization was not needed).
Text in PointText (8) = Relay date and time received after synchronization, corrected with reading delay (empty if synchronization was not needed).

Download Disturbance Record

Description of this command:
This command reads a disturbance record oscillography report of FREQ type and requires a valid driver license. Format of output files is COMTRADE ASCII. Both .cfg and .dat are generated according to IEEE Standard Common Format for Transient Data Exchange (COMTRADE) for Power Systems (IEEE Std C37.111-1991). Additional .hdr and .inf files are generated, and can include user-supplied information through the DriverP8 parameter. This command automatically forces a minimum timeout of 3000 ms.
Methods used to run this command:
Analog Input (ReadNumericValues)

Number of points accepted by this command:
1-8
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
38
Meaning of the DriverP2 parameter:
Indicates the oscillography report number to be read (1 to 4).
Meaning of the DriverP3 parameter:
Indicates the format for returned dates:
0 = Use English format (MM/DD/YYYY hh:mm:ss.000)
1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)
Meaning of the DriverP6 parameter:
Indicates the path where the COMTRADE files will be generated. If this property is empty, the local driver folder is used by default.
Meaning of the DriverP7 parameter:
Indicates a TriggerTime that should not be downloaded if it happens to be the last TriggerTime available in the relay. If empty, the last TriggerTime available is downloaded. Format must be 'YYYY-MM-DD hh:mm:ss.uuuuuu000', where uuuuuu=microseconds.
Meaning of the DriverP8 parameter:
Comma-separated list with additional information about the relay to be used in the .hdr and .inf files. Format: FieldName1=value1,FieldName2=value2,etc. Example: ID=123456,SerialNumber=A55GH77,Port=Ethernet
Meaning of the DriverP9 parameter:
Filename root for .hdr, .cfg, .dat and .inf files. If empty, 'XGEDFF_DisturbanceRecord.Relayxxx.hdr', 'XGEDFF_DisturbanceRecord.Relayxxx.cfg', , 'XGEDFF_DisturbanceRecord.Relayxxx.dat' and 'XGEDFF_DisturbanceRecord.Relayxxx.inf' will be used, where xxx is the device unit address. Existing files with same name are overwritten.
Values that are returned:
Value in PointValue (0) = Number of channels downloaded
Value in PointValue (1) = Report number
Value in PointValue (2) = Frequency
Value in PointValue (3) = First sample (always 0)
Value in PointValue (4) = Trigger point
Value in PointValue (5) = Number of samples
Value in PointValue (6) = Number of analog channels
Value in PointValue (7) = Number of first 10 digital channels
Text in PointText (0) = Download status
Text in PointText (1) = Report number (text version, can be 'n/a' when report is not available))
Text in PointText (2) = Relay location
Text in PointText (3) = First sample time
Text in PointText (4) = Trigger time
Text in PointText (5) = Last sample time
Text in PointText (6) = Comma-separated list of analog channel names
Text in PointText (7) = Comma-separated list of digital channel names

Read Disturbance Record Date and Time

Description of this command:
This command reads date and time for a specific disturbance record.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
39
Meaning of the DriverP2 parameter:
Record to be read (1-4)
Meaning of the DriverP3 parameter:
Indicates the format for returned dates:
0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)
Values that are returned:
Text in PointText (0) = Date and Time

Read Fault Data

Description of this command:
This command reads a block of fault data values from a specific disturbance record.
Methods used to run this command:
Analog Input (ReadNumericValues)
Number of points accepted by this command:
1-47
Meaning of the DriverP0 parameter:
Relay Number (1-255).
Meaning of the DriverP1 parameter:
40
Meaning of the DriverP2 parameter:
Record to be read (1-4)
Meaning of the DriverP3 parameter:
Indicates the format for returned dates:
0 = Use English format (MM/DD/YYYY hh:mm:ss.000)
1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)
Values that are returned:
Text in PointText (0) = Fault Date and Time
Value in PointValue (1) = 27F_ARRANQUE (Hz)
Value in PointValue (2) = 27F_tACTUACION (seg)
Value in PointValue (3) = 27F_tRESET (seg)
Value in PointValue (4) = 59F_ARRANQUE (Hz)
Value in PointValue (5) = 59F_tACTUACION (seg)
Value in PointValue (6) = 59F_tRESET (seg)
Text in PointText (7) = 81N1_TIPOFUNCION
Value in PointValue (8) = 81N1_ARRANQUE (Hz)
Value in PointValue (9) = 81N1_TEMPORIZACION (seg)
Value in PointValue (10) = 81N1_dFdT (Hz/seg)
Value in PointValue (11) = 81N1_tREPOSICION (seg)
Text in PointText (12) = 81N2_TIPOFUNCION
Value in PointValue (13) = 81N2_ARRANQUE (Hz)
Value in PointValue (14) = 81N2_TEMPORIZACION (seg)
Value in PointValue (15) = 81N2_dFdT (Hz/seg)
Value in PointValue (16) = 81N2_tREPOSICION (seg)
Text in PointText (17) = 81N3_TIPOFUNCION
Value in PointValue (18) = 81N3_ARRANQUE (Hz)
Value in PointValue (19) = 81N3_TEMPORIZACION (seg)
Value in PointValue (20) = 81N3_dFdT (Hz/seg)
Value in PointValue (21) = 81N3_tREPOSICION (seg)
Text in PointText (22) = 81N4_TIPOFUNCION
Value in PointValue (23) = 81N4_ARRANQUE (Hz)
Value in PointValue (24) = 81N4_TEMPORIZACION (seg)
Value in PointValue (25) = 81N4_dFdT (Hz/seg)
Value in PointValue (26) = 81N4_tREPOSICION (seg)
Text in PointText (27) = 81N5_TIPOFUNCION
Value in PointValue (28) = 81N5_ARRANQUE (Hz)
Value in PointValue (29) = 81N5_TEMPORIZACION (seg)
Value in PointValue (30) = 81N5_dFdT (Hz/seg)
Value in PointValue (31) = 81N5_tREPOSICION (seg)
Text in PointText (32) = 81N6_TIPOFUNCION
Value in PointValue (33) = 81N6_ARRANQUE (Hz)
Value in PointValue (34) = 81N6_TEMPORIZACION (seg)
Value in PointValue (35) = 81N6_dFdT (Hz/seg)
Value in PointValue (36) = 81N6_tREPOSICION (seg)
Text in PointText (37) = 81N7_TIPOFUNCION
Value in PointValue (38) = 81N7_ARRANQUE (Hz)
Value in PointValue (39) = 81N7_TEMPORIZACION (seg)

Value in PointValue (40) = 81N7_dFdT (Hz/seg)
Value in PointValue (41) = 81N7_tREPOSICION (seg)
Text in PointText (42) = 81N8_TIPOFUNCION
Value in PointValue (43) = 81N8_ARRANQUE (Hz)
Value in PointValue (44) = 81N8_TEMPORIZACION (seg)
Value in PointValue (45) = 81N8_dFdT (Hz/seg)
Value in PointValue (46) = 81N8_tREPOSICION (se

Error messages

The following list shows the possible error messages that can be returned by the driver during a failed communication in the 'Status' property.

[1005] DRIVER (Internal): Invalid driver stage
[1008] DRIVER (Internal): Command execution requires a valid license
[1010] DRIVER (Internal): Error calculating elapsed milliseconds
[1201] DRIVER (System): Error closing %s
[1202] DRIVER (System): Error creating %s
[1208] DRIVER (System): Error seeking end of %s
[1210] DRIVER (System): Error writing to %s
[1214] DRIVER (System): Error deleting %s
[1300] PROTOCOL (Timeout): No answer
[1313] PROTOCOL (Timeout): No answer from meter after retrying with a Start Communications message
[1316] PROTOCOL (Remote): Download sequence interrupted by relay
[1332] PROTOCOL (Remote): Invalid date received
[1333] PROTOCOL (Remote): Couldn't decode received date
[1334] PROTOCOL (Remote): Invalid time received
[1338] PROTOCOL (Remote): Couldn't decode reference date
[1343] PROTOCOL (Remote): Error receiving fault data
[1414] PROTOCOL (Format): Invalid received data length
[1415] PROTOCOL (Format): Invalid response format
[1416] PROTOCOL (Format): Invalid unit code received
[1433] PROTOCOL (Format): Validation error in device response
[1439] PROTOCOL (Format): Unknown code received
[1464] PROTOCOL (Format): Operation failed possibly due to invalid password
[2002] CONFIG (DataType): Digital inputs are not supported by this driver
[2130] CONFIG (NumValues): Invalid number of values (must be 7)
[2175] CONFIG (NumValues): Too many values (max=1)
[2245] CONFIG (NumValues): Too many values requested
[3014] CONFIG (P0): Invalid device address (0-255)
[3508] CONFIG (P1): Invalid command
[4142] CONFIG (P2): Invalid data value (1-256)
[4163] CONFIG (P2): Invalid event index (0-65535)
[4164] CONFIG (P2): Invalid oscillography report number (1-4)
[6040] CONFIG (P6): Invalid message (minimum length is 10 bytes)
[9507] CONFIG (Value): Invalid year in PointValue (2000-2099)
[9508] CONFIG (Value): Invalid month in PointValue (1-12)
[9509] CONFIG (Value): Invalid day in PointValue (1-31)
[9510] CONFIG (Value): Invalid hour in PointValue (0-23)
[9511] CONFIG (Value): Invalid minutes in PointValue (0-59)
[9512] CONFIG (Value): Invalid milliseconds in PointValue (0-999)
[9515] CONFIG (Value): Invalid seconds in PointValue (0-59)

Supported devices

This driver can communicate with these devices, but is not necessarily limited to this list:

GENERAL ELECTRIC DFF 1000 3C2 Digital Frequency Relays