A Sierra Monitor Company

Driver Manual
(Supplement to the FieldServer Instruction Manual)

FS-8700-86 Carrier DataPort

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after August 2008

Driver Version:	**1.03**
Document Revision:	**11**

TABLE OF CONTENTS

1. Carrier DataPort Description

The Carrier DataPort driver allows the FieldServer to transfer data to and from devices over either RS-232 or RS-485 using Carrier DataPort protocol. The FieldServer can emulate either a Server or Client.

The DataPort device provides a gateway to CCN devices. This driver polls the DataPort device which in turn reads data from the CCN devices. Up to 15 system elements may be connected to a DataPort Device.

Carrier limits the number of CCN devices that can polled from a DataPort Device and also limits the data that can be transferred between some CCN devices and the DataPort device. For information on these limitations please consult the Carrier Corporation.

The driver is an active Client driver. This means that it initiates read polls with the DataPort device which is expected to provide responses. Server functionality is provided by the driver too.

The driver is configured to allow a single Data Table (usually the Display Table) to be read from the CCN devices via the DataPort device. As the table typically contains more than one data element, the retrieved data is stored in a number of consecutive Data Array locations in the FieldServer. The driver can provide descriptions for each of the table values retrieved.

The driver has no advanced knowledge of the CCN devices and their Data Tables. This means that the driver handles each table in a generic way, without regard for the particular variables that constitute the tables. The most important consequence of this is that the variable values are stored in the order in which they appear in the response from the DataPort device. It is not possible to map particular variable values to particular locations in the FieldServer Data Arrays.

2. Driver Scope of Supply

2.1. Supplied by FieldServer Technologies for this driver

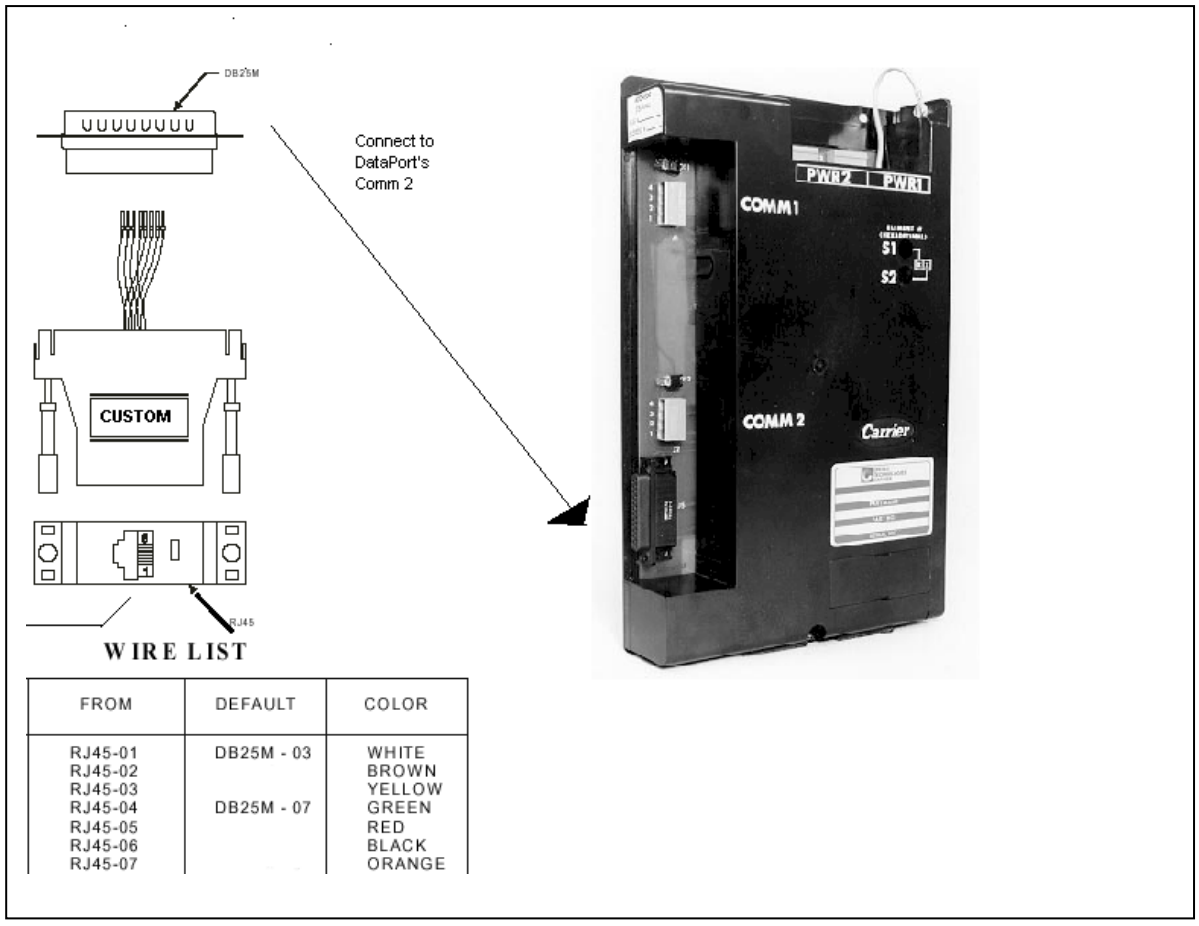
FieldServer Technologies PART #	DESCRIPTION
FS-8917-02	RJ45 to DB9F connector adapter
FS-8917-17	RJ45 to DB25M connection adapter
SPA59132	RS-485 connection adapter
FS-8700-86	Driver Manual.

3. Hardware Connections

The FieldServer is connected to the Carrier DataPort device as shown below.

Configure the DataPort Device according to manufacturer's instructions. This driver requires that the DataPort device's DTPCONFIG table has been configured prior to connection with a FieldServer. In addition, consult the manufacturer's information on connecting Carrier Device's to CCN network.

Note: Typical connections are 9600,N,8,1.



WIRE LIST

FROM	DEFAULT	COLOR
RJ45-01	DB25M - 03	WHITE
RJ45-02		BROWN
RJ45-03		YELLOW
RJ45-04	DB25M - 07	GREEN
RJ45-05		RED
RJ45-06		BLACK
RJ45-07		ORANGE

4. Configuring the FieldServer as a Carrier DataPort Client

It is not possible to complete a configuration for communication with a DataPort device until you are familiar with the data available from the devices connected to the DataPort. The DataPort device does not provide a method for discovering the data tables and variables that are available in all the Carrier devices.

Configuring the DataPort driver as a Client is easy; however, you will not be able to complete the server side configuration until you have a list of the variables and the order in which the DataPort device will report them. The driver is capable of helping you determine this information but cannot auto-complete the configuration. This method is discussed in Appendix A.

For a detailed discussion on FieldServer configuration, please refer to the FieldServer Configuration Manual. The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer (See ".csv" sample files provided with the FieldServer).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a Carrier DataPort Server.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for Carrier DataPort communications, the driver independent FieldServer buffers need to be declared in the "Data Arrays" section, the destination device addresses need to be declared in the "Client Side Nodes" section, and the data required from the servers needs to be mapped in the "Client Side Map Descriptors" section. Details on how to do this can be found below.

Note that in the tables, * indicates an optional parameter, with the **bold** legal value being the default.

4.1. Data Arrays

Section Title
Data_Arrays

Column Title	Function	Legal Values
Data_Array_Name	Provide name for Data Array	Up to 15 alphanumeric characters
Data_Format	Provide data format. Each Data Array can only take on one format.	FLOAT, BIT, UInt16, SInt16, Packed_Bit, Byte, Packed_Byte, Swapped_Byte
Data_Array_Length	Number of Data Objects. Must be larger than the data storage area required for the data being placed in this array.	1-10,000

Example

```
//  Data Arrays
//
Data_Arrays
Data_Array_Name,    Data_Format,    Data_Array_Length
DA_AI_01,           UInt16,         200
DA_AO_01,           UInt16,         200
DA_DI_01,           Bit,            200
DA_DO_01,           Bit,            200
```

4.2. Client Side Connections

Section Title		
Connections		
Column Title	**Function**	**Legal Values**
Port	Specify which port the device is connected to the FieldServer	P1-P8, (R1, R2 with converter)[1]
Baud*	Specify baud rate.	600 , 1200, 2400, **9600** (Vendor limitation)
Parity*	Specify parity	**None** (Vendor limitation)
Data_Bits*	Specify data bits	**8** (Vendor limitation)
Stop_Bits*	Specify stop bits.	**1** (Vendor limitation)
Protocol	Specify protocol used	CarrierDP
Handshaking*	Specify hardware handshaking	**None**
Poll _Delay*	Time between internal polls	0-32000 seconds, **1 second**
Timeout[2]	Specifies the max amount of time the driver must wait for a complete response. If the Data Port table is long then increase the timeout above the default until timeout errors disappear.	2 seconds
Application	Refer to notes in Appendix B.3	Print_storage_locations
Start_Method*	If the parameter is not configured or set to 0 (default), the driver will identify the start of a message as FORMFEED (0x0C) and the end as two carriage returns (0x0D 0x0D) When the parameter is set to 1, the first carriage return (0x0D) will be considered the start of the message (all characters before the first carriage return will be ignored). and the end as two carriage returns (0x0D 0x0D)	1,**0**

Example

```
//  Client Side Connections

Connections
Port,   Baud,   Parity,   Data_Bits,   Stop_Bits,   Protocol ,   Handshaking,   Poll_Delay
P8,     9600,   None,     8      ,     1      ,     CarrierDP,   None      ,   0.100s
```

[1] Not all ports shown are necessarily supported by the hardware. Consult the appropriate Instruction manual for details of the ports available on specific hardware.
[2] See Appendix B.1 for additional information

4.3. Client Side Node Descriptors

Section Title		
Nodes		
Column Title	**Function**	**Legal Values**
Node_Name	Provide name for node	Up to 32 alphanumeric characters
Node_ID	These correspond to the 'devices' configured in the DTPConfig. Thus the Node_ID is not the address of the final CCN device. The DataPort DTPConfig table maps a device number (1...15) to a bus number (0-239). Use the Node_ID to tell the driver which device to use.	1-15
Protocol	Specify protocol used	CarrierDP
Port	Specify which port the device is connected to the FieldServer	P1-P8, R1-R2[3]

Example

```
// Client Side Nodes

Nodes
Node_Name,      Node_ID,    Protocol ,    Port
FAN1    ,       1     ,     CarrierDP,    P8
```

[3] Not all ports shown are necessarily supported by the hardware. Consult the appropriate Instruction manual for details of the ports available on specific hardware.

4.4. Client Side Map Descriptors

4.4.1. FieldServer Related Map Descriptor Parameters

Column Title	Function	Legal Values
Map_Descriptor_Name	Name of this Map Descriptor	Up to 32 alphanumeric characters
Data_Array_Name	Name of Data Array where data is to be stored in the FieldServer	One of the Data Array names from "Data Array" section above
Data_Array_Location	Starting location in Data Array	0 to maximum specified in "Data Array" section above
Function	Function of Client Map Descriptor	Rdbc, Wrbc, Wrbx

4.4.2. Driver Related Map Descriptor Parameters

Column Title	Function	Legal Values
Node_Name	Name of Node to fetch data from	One of the node names specified in "Client Node Descriptor" above
Data_Type	This commonly used parameter is not required for this driver.	
Length	Length of Map Descriptor. When reading a compete table, set the length to the maximum number of data values you want stored. Additional information on the length parameter is provided in Appendix A.3.	1 – 1000
Address	This commonly used parameter is not required for this driver.	
Store_As*	Use the ASCII or AsciiLog format when you are discovering the variables contained in a table by reading a table. Refer to Appendix A for more information.	ASCII, AsciiLog, **Values**
DA_Byte_Name*	If defined, the driver stores the 'field status' value in this array.	The name of a Data Array defined in the Data_Array section of the configuration file.
DA_Float_Name*	If defined, the driver stores the 'field units' value in this array.	The name of a Data Array defined in the Data_Array section of the configuration file.

4.4.3. Timing Parameters

Column Title	Function	Legal Values
Scan_Interval	Rate at which data is polled	>0.1s

4.4.4. Map Descriptor Example 1 – Read

This example illustrates how to read data from the DataPort.

Some basics first: The Map Descriptor is connected to a node by means of the node name and a node definition provides a connection to a port. Thus this Map Descriptor is connected to a port via its node. The FieldServer will use that port to send this poll. The poll will be generated every 5 seconds in this example.

The values extracted from the response will be stored in the array called DA_DISPLAY. Ensure that it is suitable format for storing number – FLOAT is suggested. The driver stores the value of the 1st element at offset 1, the 2nd element at offset 2 ….and the driver stores the number of table elements whose values have been successfully stored at offset zero.

```
//  Client Side Map Descriptors

Map Descriptors
Map_Descriptor_Name,    Data_Array_Name,    Data_Array_Offset,    Function,    Node_Name,    Length,    Scan_Interval
Read_Table_Md      ,    Da_Display     ,    0                     ,    Rdbc    ,    FAN01    ,    100    ,    5.0s
```

Responses get stored in this Data Array. Table element x gets stored at offset x, where x is a non-zero integer.

Offset zero is used by the driver to report how many value were stored.

The driver generates a read poll continuously.

The Node_Name connects the Map Descriptor to a Node definition.

The length is set to a number big enough to contain all the table's variables.

5. Configuring the FieldServer as a Carrier DataPort Server

For a detailed discussion on FieldServer configuration, please refer to the FieldServer Configuration Manual. The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer (See ".csv" sample files provided with the FieldServer).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a Carrier DataPort Client.

The FieldServer can be configured to emulate a Carrier DataPort Device. The user is able to define a variable quantity of variables. The FieldServer may be polled and will respond like a DataPort device.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for Carrier DataPort communications, the driver independent FieldServer buffers need to be declared in the "Data Arrays" section, the FieldServer virtual node(s) needs to be declared in the "Server Side Nodes" section, and the data to be provided to the Clients needs to be mapped in the "Server Side Map Descriptors" section. Details on how to do this can be found below.

Note that in the tables, * indicates an optional parameter, with the **bold** legal value being the default.

5.1. Data Arrays

Section Title
Data_Arrays

Column Title	Function	Legal Values
Data_Array_Name	Provide name for Data Array	Up to 15 alphanumeric characters
Data_Format	Provide data format. Each Data Array can only take on one format.	Float, Bit, Uint16, Sint16, Packed_Bit, Byte, Packed_Byte, Swapped_Byte
Data_Array_Length	Number of Data Objects. Must be larger than the data storage area required for the data being placed in this array.	1-10,000

Example

```
//  Data Arrays
//
Data_Arrays
Data_Array_Name,    Data_Format,    Data_Array_Length
DA_AI_01,           Uint16,         200
DA_AO_01,           Uint16,         200
DA_DI_01,           Bit,            200
DA_DO_01,           Bit,            200
```

5.2. Server Side Connections

Section Title
Connections

Column Title	Function	Legal Values
Port	Specify which port the device is connected to the FieldServer	P1-P8, (R1-R2 with converter)[4]
Baud*	Specify baud rate	300, 600 , 1200, 2400, **9600** (Vendor limitation)
Parity*	Specify parity	**None** (Vendor limitation)
Data_Bits*	Specify data bits	**8** (Vendor limitation)
Stop_Bits*	Specify stop bits	**1** (Vendor limitation)
Protocol	Specify protocol used	CarrierDP
Handshaking*	Specify hardware handshaking	**None**

Example

```
//  Server Side Connections

Connections
Port,       Baud,   Parity,  Data_Bits,  Stop_Bits,  Protocol ,  Handshaking,  Poll_Delay
P8,         9600,   None,    8       ,   1       ,   CarrierDP,  None      ,   0.100s
```

5.3. Server Side Node Descriptors

Section Title
Nodes

Column Title	Function	Legal Values
Node_Name	Provide name for Node	Up to 32 alphanumeric characters
Node_ID	DataPort station address of physical Server Node. These correspond to the 'devices' configured in the DTPConfig. Thus the Node_ID is not the address of the final CCN device. The DataPort DTPConfig table maps a device number (1...15) to a bus number (0-239). Use the Node_ID to tell the driver which device to use.	1-15
Protocol	Specify protocol used	CarrierDP

Example

```
//  Server Side Nodes

Nodes
Node_Name,      Node_ID,    Protocol ,      Port[5]
FAN1    ,       1       ,   CarrierDP,      P8
```

[4] Not all ports shown are necessarily supported by the hardware. Consult the appropriate Instruction manual for details of the ports available on specific hardware.

[5] It is common to leave server nodes unconnected to a port. This means that the FieldServer can respond with the Node's data irrespective of which port the request is received on.

5.4. Server Side Map Descriptors

5.4.1. FieldServer Specific Map Descriptor Parameters

Column Title	Function	Legal Values
Map_Descriptor_Name	Name of this Map Descriptor	Up to 32 alphanumeric characters
Data_Array_Name	Name of Data Array where data is to be stored in the FieldServer	One of the Data Array names from "Data Array" section above
Data_Array_Location	Starting location in Data Array	0 to maximum specified in "Data Array" section above
Function	Function of Client Map Descriptor	passive

5.4.2. Driver Specific Map Descriptor Parameters

Column Title	Function	Legal Values
Node_Name	Name of Node to fetch data from	One of the Node Names specified in "Server Node Descriptor" above
Length[6]	Length of Map Descriptor. When reading a compete table, set to the maximum number of data values to be stored.	1 – 1000
Table_Name*	The name of the table to be polled, e.g. DISPLAY. This parameter is for display purposes only. The driver does not use the value of this parameter. Some system elements have multiple instances of the same table name. For example, the Terminal System Manager has 64 Temperature Zone configuration tables. The individual tables are named TZONE1 though TZONE64. These tables are accessed by using both the primary & secondary table names. E.g. 'TZCONF TZONE1'	Only Ascii characters are permitted. When using the table name parameter to specify a primary and secondary table, leave a single space between the two names.
Field_Name	This is the field variable pneumonic.	An Ascii string which may **not** contain spaces. Max length 8 characters.
Field_Description	Returned when a Client does a read.	An Ascii string which may contain spaces. Max length 24 characters.
Field_Units	Returned when a Client does a read. If units have no meaning for the variable set to zero.	A whole number. See Appendix A.1
Field Status*	This parameter is used to set data quality information that is returned when the Client polls for data. If omitted and DA_Byte_Name has not been specified the driver returns zero as the status value.	A whole number. See Appendix A.1 for more information.

[6] Additional information on the length parameter is provided in Appendix A.

Column Title	Function	Legal Values
DA_Byte_Name*	If this parameter is defined then its value must be the name of a Data Array. Instead of the driver returning a static Field Status, it will extract the value located at the given offset and use this value as the Field Status.	The name of Data Array defined in the Data Arrays section.
On_String	If the variable has a discrete state, use this parameter to define the word that describes the state when the variable's value is 1. OR Use one of the keywords to tell the driver to send the value of the associated array elements: NUMERIC – a number TIME - a time value formatted as hh:mm STRING - a string of bytes DOW – occupancy string When using the string keyword the driver reads x consecutive array elements and treats them as ASCII character values in forming the response. X is defined by the length parameter.	NUMERIC TIME STRING DOW Or any other Ascii string which may **not** contain spaces.
Off_String	If the variable has a discrete state, use this parameter to define the word that describes the state when the variable's value is zero. If you have used a keywords described above then simply put a dash in this field.	An ASCII string which may **not** contain spaces.
Length	Always set the length to 1 unless you use the key word 'STRING' as the *On_String* parameter.	1

5.4.3. Timing Parameters

Column Title	Function	Legal Values
Scada_Hold_Timeout	Specifies time Server side waits before responding to Client that node is offline on FieldServer Client side.	>1.0s

5.4.4. Map Descriptor Example.

This example shows a number of server Map Descriptors used to define a table called 'DISPLAY'. If a Client sends a read table request the driver responds by sending all the appropriate data for every Map Descriptor with the same table name (provided that the node's match too.). The fields are returned in the order in which you define them in the configuration file.

```
//  Server Side Map Descriptors

Map Descriptors
Map_Descriptor_Name,  Function,  Node_Name,  Table_Name,  Field_Name,  Field_Description,  Field_Units,  On_String,  Off_String,  Data_Array_Name,  Data_Array_Offset,  Length,
Display_MD01,         passive,   Node_1,     DISPLAY,     MODE ,      Desired Mode ,      ,             ON ,         OFF ,        TABLE_DISPLAY,    01 ,               1,
Display_MD02 ,        passive,   Node_1,     DISPLAY,     ALARM ,     Equipment Status,   ,             ALARM ,      NORMAL,      TABLE_DISPLAY,    02 ,               1,
Display_MD03 ,        passive,   Node_1,     DISPLAY,     CSPT ,      Controlling Setp.,  dF ,          NUMERIC ,    -,           TABLE_DISPLAY,    03 ,               1,
Display_MD04 ,        passive,   Node_1,     DISPLAY,     SPT ,       Controlling Temp,   dF ,          NUMERIC,     -,           TABLE_DISPLAY,    04,                1,
Display_MD05 ,        passive,   Node_1,     DISPLAY,     RAT ,       Space Temp,         dF ,          NUMERIC ,    -,           TABLE_DISPLAY,    05,                1,
Display_MD06 ,        passive,   Node_1,     DISPLAY,     SAT ,       Supply Air Temp.,   dF ,          NUMERIC,     -,           TABLE_DISPLAY,    06,                1,
Display_MD07 ,        passive,   Node_1,     DISPLAY,     FANSTAT,    Fan Mode,           ,             ON,          OFF ,        TABLE_DISPLAY,    07,                1,
Display_MD08 ,        passive,   Node_1,     DISPLAY,     CCAP ,      Cooling Capacity,   % ,           NUMERIC,     - ,          TABLE_DISPLAY,    08,                1,
Display_MD09 ,        passive,   Node_1,     DISPLAY,     HCAP ,      Heating Capacity,   % ,           NUMERIC,     - ,          TABLE_DISPLAY,    09,                1,
Display_MD10 ,        passive,   Node_1,     DISPLAY,     FLTSTAT,    Filter Status,      ,             DIRTY,       CLEAN ,      TABLE_DISPLAY,    10,                1,
```

All the Server Map Descriptors are passive.

By using the NUMERIC keyword, the driver is told to report the value of the variable HCAP as a number. Thus the driver sends the value of the array named TABLE_DISPLAY offset 9 to the Client.

If the value of the array named TABLE_DISPLAY, offset 10 is a 1 then the FieldServer will report he FLTSTAT variable as DIRTY. If it is zero then the variable's state will be reported as clean.

Appendix A. Advanced Topics

Appendix A.1. Field Status & Field Engineering Units

The following tables duplicate information available from Carrier Corporation. We provide it for reference purposes. It is best to ask the vendor for current data.

Value	Engineering Units	Value	Engineering Units	Value	Engineering Units
000	no units	051	feet per minute	260	Pascal
001	degrees F	052	thousands of cubic feet per minute	262	delta degrees C
002	degrees F	053	thousands of cubic feet per hour	263	degrees C
003	percent	054	tons	264	delta degrees C
004	inches of water	055	tons per hour	267	degrees C
005	milliamps	056	revolutions per minute	270	Pascal
006	delta degrees F	057	percent open	272	delta degrees C
007	degrees F	058	hours	273	degrees C
008	delta degrees F	059	gallons	274	delta degrees C
010	Volts	064	on/off input	276	kiloPascals
011	degrees F	065	off/on input	288	liters per minute
013	percent	066	input pulses on	289	liter per hour
014	inches of water	067	input pulses off	290	cubic meters per minute
015	milliamps	068	seconds	291	cubic meters per hour
016	delta degrees F	069	normal/alarm	292	kiloPascals
017	degrees F	070	Hz	293	kilograms per hour
018	delta degrees F	080	minutes	295	kilowatt hours
020	pounds per square inch	081	hours	296	kilowatts
032	gallons per minute	082	revolutions per minute	297	millimeters of water
033	gallons per hour	124	clock	298	millimeters of mercury
034	thousands of gallons per minute	126	ASCII	299	kilowatt hours
035	thousands of gallons per hour	128	no units	300	kilowatts
036	pounds per square inch, gauge	133	milliamp	301	degrees C
037	pounds per hour	137	pounds per square inch	302	percent relative humidity
038	thousands of pounds per hour	138	volts	303	amps
039	BTUs per hour	144	kilowatts	304	volts
040	thousands of BTUs	145	kilowatt hours/pulse	305	cubic meters per minute
041	inches of water	146	pulses	306	cubic meters per hour
042	inches of mercury	192	on/off output	307	meters per second
043	kilowatt hours	193	off/on output	310	tons
044	kilowatts	194	pulsed on output	311	tons per hour
045	degrees F	195	pulsed off output	312	revolutions per hour
046	percent relative humidity	208	steps	313	percent open
047	amps	254	ASCII	314	hours
048	volts	256	no units	315	liters
049	cubic feet per minute	257	degrees C		
050	cubic feet per hour	258	degrees C		

Error Conditions	Force Conditions					
Conditions	A	B	C	D	E	F
No Force	0	1	2	3	4	5
Fire	16	17	18	19	20	21
Safety	32	33	34	35	36	37
Service Tool	48	49	50	51	52	53
Supervisor	64	65	66	67	68	69
Monitor	80	81	82	83	84	85
Minimum-off	96	97	98	99	100	101
Control	112	113	114	115	116	117
BEST	128	129	130	131	132	133
Temp Override	144	145	146	147	148	149
Loadshed	160	161	162	163	164	165

Error Conditions:	
A	no error
B	hardware or communications error
C	software error
D	low alarm limit exceeded (analog point),or point in alarm (discrete point)
E	high alarm limit exceeded
F	unconfigured point (VVT Gateway only)

Force Conditions:	
No Force	
Fire	forced by fire alarm equipment
Safety	forced by internal safety override
Service Tool	forced by CCN Service Tool
Supervisor	forced by local Building Supervisor
Monitor	forced by remote Building Supervisor
Minimum-off	forced by minimum off time requirement
Control	forced by System Software Option
BEST	forced by BEST program
Temp Override	forced by temperature override
Loadshed	forced by Loadshed System Software Option

Appendix A.2. Field / Variable Names

A list of variable names vs. table names vs. equipment types is not provided in this manual. The reasons for this are that they are not all available to us they can be configured in some devices using software provided by the Carrier Corporation.

Consult the points list with the literature provided with each type of equipment from Carrier to obtain variable names. Alternately use the software provided by Carrier to browse the network and determine the table and variable names.

This driver may also be used to obtain a list of variable names for a given table. On the following pages are sample Map Descriptors which may be included in the configuration to help obtain this information. FieldServer recommends that if these Map Descriptors are used to obtain variable name information, they should be removed from the final configuration as they will consume resource and processing time.

This example illustrates how to create a Map Descriptor which reads a table and dumps the response in ASCII format to a Data Array so that RUINET(a utility provided with the FieldServer) can be used to browse and read the results.

```
Data_Arrays
Data_Array_Name,   Data_Format,   Data_Array_Length
DA_DUMP,           BYTE,          2000
```

```
Map Descriptors
Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_Name,  Length,  Scan_Interval,  Storet_As
Md1                ,  DA_DUMP       ,  0                ,  rdbc    ,  FAN01    ,  1000  ,  5.0s          ,  ASCII
```

The s=Data Array DA_DUMP has been defined with format BYTE. When viewing this table with RUINET display the array in 'STRING' format so that you can read it.

This is what tells the driver to dump the table, its variables names and variable descriptions in ASCII format.

This example illustrates how to make a Map Descriptor which reads a table and dumps the response in ASCII format to the error log. The error log can be dumped to a file on your computer using RUIDEBUG (a utility supplied with your FieldServer)

```
Data_Arrays
Data_Array_Name,   Data_Format,   Data_Array_Length
DA_DUMP,           BYTE,          2000
```

```
Map Descriptors
Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_Name,  Length,  Scan_Interval,  Storet_As
Md1                ,  Da_Dump       ,  0                ,  rdbc    ,  FAN01    ,  1000  ,  5.0s          ,  AsciiLog
```

The following fragment from the error log is typical of the response to a Map Descriptor like the one above.

```
T01> ASCII Dump Requested for MD=<MapDesc1>
T01> Field1   99.0       000 000 Desc1 1 1
T01> Field2   98.0       000 000 Desc2222222
T01> Field3          on 000 000 33333 33333 3
T01> Field4         Off 000 000 44444444444444
T01> Field5         Off 000 000 5555 55555555
T01> Field6         Off 000 000 6666666666666
T01> Field7         Off 000 000 7
T01> Field8         Off 000 000 888 888 88888
T01> Field9         Off 000 000 99999999999 3
T01> Fielda       DIRTY 000 000 aaaaaaaaaaaaa
T01> Fieldb   0.0       000 000 bbbb
T01> Fieldc         Off 000 000 c
T01> Fieldd   -1.0       000 000 ddddddddddddd
```

Appendix A.3. Map Descriptor Length Explained

The Length parameter is specified as part of the Map Descriptor.

Client Reads:
The length means: "The number of table variable's whose values are to be stored when the response is received." If you do not know the length of the table in advance, set the length to a larger number (e.g. 100). The driver will process the response; if the table contains more than 100 elements then some data will be discarded.

Server:
The length parameter is used when the server returns a value that is a string. The length is used to tell the driver how many characters to extract from consecutive array location to form the response string. When the server returns a value that is a number, state or time the length should always be 1.

Appendix A.4. How the Client stores the states/values of the Table Variables.

Appendix A.4.1. Discrete States

When a Carrier DataPort device reports the state of a table variable which has a discrete state, it reports the state as a keyword like on/off. This driver converts the keywords to facilitate reading by other devices.

The driver is programmed to recognize the keywords listed below. The user can add keywords by specifying additional information in the configuration file.

State Word	Value	State Word	Value	State Word	Value
CLEAN	1	ABNORMAL	1	OPEN	1
DIRTY	0	NORMAL	0	CLOSE	0
HEAT	1	LOCAL	0	CLOSED	0
COOL	0	REMOTE	1	ALARM	1
ON	1	LOCAL R	0		
OFF	0	RUNNING	1		

If the driver doesn't recognize the state word, it stores the characters of the state word as decimal values based on their ASCII value. the number of characters stored is dependent on the length parameter.

For example, say the driver responds, reporting a variable to be a state 'INCREDIBLE'. If the length parameter of the polling Map Descriptor is 1 then the driver stores the first character of the word incredible; by storing a value of 73 (An uppercase 'I' is the seventy third character in the ASCII alphabet.).

The driver recognizes discrete state words by checking the 1st character of the value field. If it is a non-digit then it is regarded as a state word. The comparison against keywords in the list is done without respect for the case of the letters.

Unrecognized Discrete State Words
If the driver does not recognize the discrete state word that has been used it will report the following error - CarrDP:#24 Err. MD=<MapDesc1> discrete state word not recognized.

The unrecognized discrete word can be found by extracting 10 characters from the line starting at the 10th character. Once the 10 characters have been extracted they are left and right trimmed to remove leading and trailing spaces.

In the following two examples the keywords that are not recognized are 'Reset T' and 'Tripout' respectively

```
CarrDP:#24 Err. MD=<MapDesc1> discrete state word not recognized.
T02>            <MODE       Reset T 000 000 Control Mode
>
T02> CarrDP:#24 Err. MD=<MapDesc1> discrete state word not recognized.
T02>            <STATUS     Tripout   000 000 Run Status
>
```

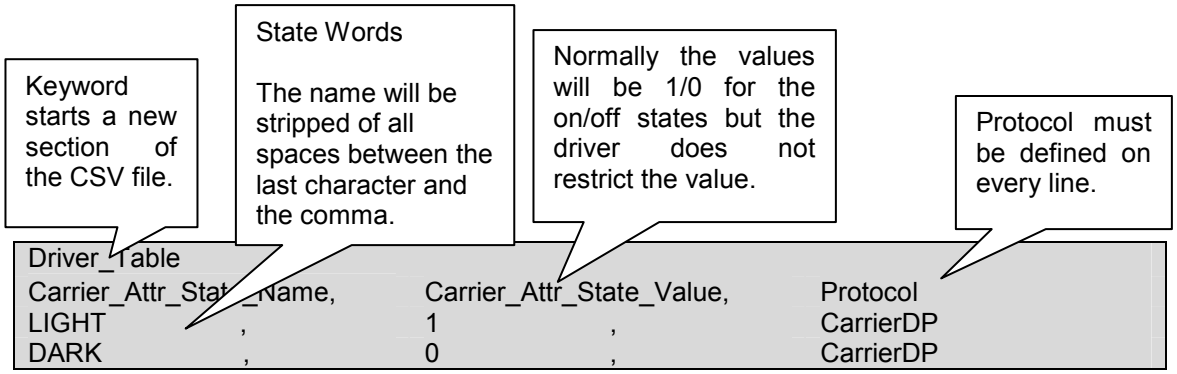
In the following example the keyword '********' is not being recognized. If this message is printed it is necessary to consult Carrier Corp. to learn why a variables' value is printed as '********'. It may be that the value is over range or invalid.

```
T02> CarrDP:#24 Err. MD=<MapDesc1> discrete state word not recognized.
T02>            <CHWPD    ********** 020 000 Chilled Water Delta P
>
T02>
```

Extending the List of Discrete State Words

You can extend the list of state words the driver recognizes by modifying the configuration CSV file.

The following example adds three state words. If a device reports the state of the variable as LIGHT then the driver will store the value of 1, if on the other hand the state is reported as DARK then the driver will store the value zero.



This method may be used to change the values of any of the driver's default state words by duplicating the word and specifying a new value in the configuration file.

Appendix A.4.2. Time Values

If the driver receives a variable value reported in the format hh:mm then the driver stores a number obtained by multiplying the hours by 60 and adding the minutes. The driver recognizes a time value by checking the 3rd character for a colon and checking that the 1st character is a digit.

```
Value_Stored  = hh * 60 + mm

E.g. 5:30pm is reported as 17:20 and is stored as 17*60 + 20 = 1040.
```

Appendix A.4.3. Numeric Values

The driver recognizes numeric values by checking the first character of the value field. If it is a digit then the field is treated as a number.

Appendix A.4.4. Occupancy Strings / Values

If the value returned for a variable is 8 characters long and each of the characters is a one or a zero then the driver regards this as an occupancy string an converts it to a binary coded decimal value and then stores this value.

E.g.: 00101010 = 42 decimal

Appendix B. Trouble Shooting/Connections - Tips and Hints

Appendix B.1. Connection problems.

Confirm that the device you are trying to attach to the FieldServer is in fact a DataPort device and not a DataLink device which looks very similar but connects differently.
A DataLink device will require the DataLink driver – FieldServer part # FS-8700-82. Please contact FieldServer to request an exchange of driver.

Appendix B.2. Timeouts

Some Data Port tables are long and result in messages of up to 6.5 kB being sent from the data port to the FieldServer. The default timeout is insufficient in such cases.

In resolving one customer's connection problems a timeout of 4 s on a table of 134 entries was found to produce good results.

Please read the notes provided with Error message #25 in section Appendix D of this manual.

Appendix B.3. Determining Storage Locations

Set the Application parameter to 'Print_storage_locations' on the connection to tell the driver to print messages each time it stores data. The driver dumps messages in the error log reporting the Data Array name, offset, value and the 'line' from which the data was extracted.

Remove the parameter to stop the messages being printed.

Example:

In the line below the driver reports that the line beginning 'hd_pos_a…..' was processed and that the value 0.0 was stored in DA_D2_01 at offset 149.

```
T02> DPStore:DA=DA_D2_01 Off=49 Val=0.00 <hd_pos_a 0.0
T02>   See above===>hd_pos_a 0.0       003 000 Head Press A
```

Appendix B.4. How to build a script file that tests a customer log.

The following brief notes are intended for configuration engineers who are expected to be familiar with the FieldServer.

- Take the hex log file and convert to ASCII using special chars (this is an option of the log file converter)
- Choose a response line from near the end of the log (most recent). Check the line is complete.
- Place the line inside an INI file. Make the following changes
    - Replace [NP] with [FF]
    - Replace [SP] with a space
    - Replace [NULL] with a space.
- Use the following files as a guide.

Client.csv

```
Data_Arrays
Data_Array_Name,    Data_Format,    Data_Array_Length
DA_D1_01,           Float,          500
```

```
Connections
Port ,  Parity,  Baud,  Data_Bits,  Stop_Bits,  Handshaking,  Protocol,    Timeout,  Print_storage_locations
P1,     None,    9600,  8,          1,          None,         CarrierDP,   60s,      Yes
```

```
Nodes
Node_Name,  Node,  Protocol,    Port
Node_A ,    1,     CarrierDP,   P1
```

```
Map_Descriptors
Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_Name,  Length,  Scan_Interval,
CMD_GP_01,            DA_D1_01,         0,                Rdbc,      Node_A,     202,     5.0s
```

Server.csv

```
Data_Arrays
Data_Array_Name,    Data_Format,    Data_Array_Length
TABLE_DISPLAY,      Float,          500
```

```
Connections
Port ,  Parity,  Baud,  Data_Bits,  Stop_Bits,  Handshaking,  Protocol,
P1,     None,    1200,  8,          1,          None,         CarrierDP,
```

```
Nodes
Node_Name,  Node,  Protocol,
Node_A ,    1,     CarrierDP,
```

```
// When the Map Descriptor name contain ".ini" then this is assumed to be a file
// name and the file is read and xmitted byte for byte with the following exceptions.
//      When a square bracket is encountered then this is assumed to contain a special char
//            The special chard is sent and not the square brackets and its contents.
// Only one line is read. The first
// The line must be less than 20k bytes
Map_Descriptors
Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_Name,  Table_Name,  Field_Name,  Field_Description,  Field_Units,  On_String,  Off_String,  Length
Server.ini,           TABLE_DISPLAY,    0,                  Passive,   Node_A,     DISPLAY,     Field1,      Desc1 1 1,        Length,      NI°UMERIC,  -,          1
                                                                                                                              202,
```

Server.ini (all one single line)

[FF] 0 000 000 GENERAL PARAMETERS [CR] 0 000 000 [CR]ctr_type Remote 000 000 Control Type [CR]status Off 000 000 Run Status [CR]CHIL_S_S 0 000 000 CCN Chiller Start/Stop [CR]CHIL_OCC 1 000 000 Chiller Occupied? [CR]MIN_LEFT 1.0 000 000 Minutes Left for Start [CR]HC_SEL 0 000 000 Heat/Cool Select [CR]RECL_SEL 0 000 000 Heat Reclaim Select [CR] 0 000 000 [CR]ALM Normal 000 000 Alarm State [CR]alarm_1 0 000 000 Current Alarm 1 [CR]alarm_2 0 000 000 Current Alarm 2 [CR]alarm_3 0 000 000 Current Alarm 3 [CR]alarm_4 0 000 000 Current Alarm 4 [CR]alarm_5 0 000 000 Current Alarm 5 [CR] 0 000 000 [CR]CAP_T 0 003 000 Percent Total Capacity [CR]DEM_LIM 100 003 000 Active Demand Limit Val [CR]LAG_LIM 100 003 000 Lag Capacity Limit Value[CR]SP 46.4 001 000 Current Setpoint [CR]SP_OCC 1 000 000 Setpoint Occupied? [CR]CTRL_PNT 46.4 001 000 Control Point [CR]CTRL_WT 47.7 001 000 Controlled Water Temp [CR]OAT 48.8 001 000 External Temperature [CR] 0 000 000 [CR]EMSTOP 0 000 000 Emergency Stop [CR] 0 000 000 CIRCUIT A ANALOG VALUES [CR] 0 000 000 [CR]CAPA_T 0 003 000 Percent Total Capacity [CR]DP_A 45.7 020 000 Discharge Pressure [CR]SP_A 43.2 020 000 Suction Pressure [CR]CPA1_OP 45.9 020 000 Oil Pressure Cp1 [CR]CPA2_OP 45.4 020 000 Oil Pressure Cp2 [CR]DOP_A1 2.5 020 000 Oil Press Difference Cp1[CR]DOP_A2 2.1 020 000 Oil Press Difference Cp2[CR]CPA1_ECP 43.3 020 000 Economizer Pressure Cp1 [CR]CPA2_ECP 43.3 020 000 Economizer Pressure Cp2 [CR]SCT_A 50.1 001 000 Saturated Condensing Tmp[CR]SST_A 48.0 001 000 Saturated Suction Temp [CR]CPA1_DGT 48.1 001 000 Discharge Gas Temp Cp 1 [CR]CPA2_DGT 48.6 001 000 Discharge Gas Temp Cp 2 [CR]dt_a 48.6 001 000 Average Discharge Gas Tp[CR]CPA1_TMP 48.0 001 000 Motor Temperature Comp 1[CR]CPA2_TMP 47.5 001 000 Motor Temperature Comp 2[CR]CPA1_CUR 0 047 000 Motor Current Comp 1 [CR]CPA2_CUR 0 047 000 Motor Current Comp 2 [CR]EXV_A 0.0 003 000 EXV Position [CR]hd_pos_a 0.0 003 000 Head Press Actuator Pos [CR]PINCH_A -0.3 006 000 Cooler Exchange Delta T [CR]MTQ_RESA 8.7 000 000 Motor Cool TQ in Kohms [CR]CPA1_PUL 30 000 000 Motor Cooling Puls Cycle[CR] 0 000 000 CIRCUIT A DISCRETE [CR] 0 000 000 [CR]CP_A1 0 000 000 Compressor 1 Output [CR]cpa1_mc1 0 000 000 Cp1 Mtr Cool Solenoid 1[CR]cpa1_mc2 0 000 000 Cp1 Mtr Cool Solenoid 2[CR]cpa1_ols 0 000 000 Cp1, Oil Solenoid Out [CR]CP_A2 0 000 000 Compressor 2 Output [CR]cpa2_mc1 0 000 000 Cp2 Mtr Cool Solenoid 1[CR]cpa2_mc2 0 000 000 Cp2 Mtr Cool Solenoid 2[CR]cpa2_ols 0 000 000 Cp2, Oil Solenoid Out [CR]ldr_1_a 0 000 000 Cir A, Loader 1 Output [CR]ldr_2_a 0 000 000 Cir A, Loader 2 Output [CR]oil_h_a 1 000 000 Cir A, Oil Heater Output[CR]oil_l_a 1 000 000 Cir A, Oil Level Input [CR]oilpmp_a 0 000 000 Cir A, Oil Pump Output [CR]refa_iso 0 000 000 Cir A Refrig Isolate Out[CR] 0 000 000 [CR] 0 000 000 FANS OUTPUT [CR]fan_a1 0 000 000 Fan Output DO # 1 [CR]fan_a2 0 000 000 Fan Output DO # 2 [CR]fan_a3 0 000 000 Fan Output DO # 3 [CR]fan_a4 0 000 000 Fan Output DO # 4 [CR]fan_a5 0 000 000 Fan Output DO # 5 [CR]fan_a6 0 000 000 Fan Output DO # 6 [CR]fan_a7 0 000 000 Fan Output DO # 7 [CR]fan_a8 0 000 000 Fan Output DO # 8 [CR]FAN_ST_A 0 000 000 Fan Staging Number [CR] 0 000 000 CIRCUIT B ANALOG VALUES [CR] 0 000 000 [CR]CAPB_T 0 003 000 Percent Total Capacity [CR]DP_B 45.3 020 000 Discharge Pressure [CR]SP_B 43.1 020 000 Suction Pressure [CR]CPB1_OP 44.2 020 000 Oil Pressure Cp1 [CR]CPB2_OP 0.0 020 000 Oil Pressure Cp2 [CR]DOP_B1 1.3 020 000 Oil Press Difference Cp1[CR]DOP_B2 0.0 020 000 Oil Press Difference Cp2[CR]CPB1_ECP 42.9 020 000 Economizer Pressure Cp1 [CR]CPB2_ECP 42.9 020 000 Economizer Pressure Cp2 [CR]SCT_B 49.7 001 000 Saturated Condensing Tmp[CR]SST_B 47.8 001 000 Saturated Suction Temp [CR]CPB1_DGT 48.6 001 000 Discharge Gas Temp Cp 1 [CR]CPB2_DGT 0.0 001 000 Discharge Gas Temp Cp 2 [CR]dt_b 48.6 001 000 Average Discharge Gas Tp[CR]CPB1_TMP 48.1 001 000 Motor Temperature Comp 1[CR]CPB2_TMP 0.0 001 000 Motor Temperature Comp 2[CR]CPB1_CUR 0 047 000 Motor Current Comp 1 [CR]CPB2_CUR 0 047 000 Motor Current Comp 2 [CR]EXV_B 0.0 003 000 EXV Position [CR]hd_pos_b 0.0 003 000 Head Press Actuator Pos [CR]PINCH_B -0.3 006 000 Cooler Exchange Delta T [CR]MTQ_RESB 8.5 000 000 Motor Cool TQ in Kohms [CR]CPB1_PUL 30 000 000 Motor Cooling Puls Cycle[CR] 0 000 000 CIRCUIT B DISCRETE [CR] 0 000 000 [CR]CP_B1 0 000 000 Compressor 1 Output [CR]cpb1_mc1 0 000 000 Cp1 Mtr Cool Solenoid 1[CR]cpb1_mc2 0 000 000 Cp1 Mtr Cool Solenoid 2[CR]cpb1_ols 0 000 000 Cp1, Oil Solenoid Out [CR]CP_B2 0 000 000 Compressor 2 Output [CR]cpb2_mc1 0 000 000 Cp2 Mtr Cool Solenoid 1[CR]cpb2_mc2 0 000 000 Cp2 Mtr Cool Solenoid 2[CR]cpb2_ols 0 000 000 Cp2, Oil Solenoid Out [CR]ldr_1_b 0 000 000 Cir B, Loader 1 Output [CR]ldr_2_b 0 000 000 Cir B, Loader 2 Output [CR]oil_h_b 1 000 000 Cir B, Oil Heater Output[CR]oil_l_b 1 000 000 Cir B, Oil Level Input

[CR]oilpmp_b 0 000 000 Cir B, Oil Pump Output [CR]refb_iso 0 000 000 Cir B Refrig Isolate Out[CR] 0 000 000 [CR] 0 000 000 FANS OUTPUT [CR]fan_b1 0 000 000 Fan Output DO # 1 [CR]fan_b2 0 000 000 Fan Output DO # 2 [CR]fan_b3 0 000 000 Fan Output DO # 3 [CR]fan_b4 0 000 000 Fan Output DO # 4 [CR]fan_b5 0 000 000 Fan Output DO # 5 [CR]fan_b6 0 000 000 Fan Output DO # 6 [CR]fan_b7 0 000 000 Fan Output DO # 7 [CR]fan_b8 0 000 000 Fan Output DO # 8 [CR]FAN_ST_B 0 000 000 Fan Staging Number [CR] 0 000 000 UNIT DISCRETE IN [CR]onoff_sw 0 000 000 Remote On/Off Switch [CR]hc_sw 0 000 000 Remote Heat/Cool Switch [CR]recl_sw 0 000 000 Remote Reclaim Switch [CR]sept_sw 0 000 000 Remote Setpoint Switch [CR]limit_sw 0 000 000 Limit Switch Status [CR]lock_1 0 000 000 Interlock Status [CR]pump_def 0 000 000 Pump Run Status [CR]condflow 0 000 000 Condenser Flow Status [CR]elec_box 1 000 000 Electrical Box Safety Sw[CR] 0 000 000 [CR] 0 000 000 UNIT DISCRETE OUT [CR]CLPUMP_1 0 000 000 Cooler Pump #1 Command [CR]CLPUMP_2 0 000 000 Cooler Pump #2 Command [CR]ROT_PUMP 0 000 000 Rotate Pumps Now [CR]COND_PMP 0 000 000 Condenser Pump Command [CR]COOLHEAT 0 000 000 Cooler Heater Command [CR]SAFE_ALM 0 000 000 Critical Alarm Signal [CR] 0 000 000 [CR] 0 000 000 UNIT ANALOG [CR]COOL_EWT 48.0 001 000 Cooler Entering Fluid [CR]COOL_LWT 47.7 001 000 Cooler Leaving Fluid [CR]COND_EWT 0.0 001 000 Condenser Entering Fluid[CR]COND_LWT 0.0 001 000 Condenser Leaving Fluid [CR]CHWSTEMP -40.7 001 000 CHWS Temperature [CR]EXT_VDC 0.0 010 000 External 0-10 Vdc Signal[CR]COND_SP 104.0 001 000 Current Cond Setpoint [CR]tot_curr 0 047 000 Chiller Total Current [CR] 0 000 000 RECLAIM ANALOG PARAM [CR]HR_EWT 0.0 001 000 Reclaim Entering Fluid [CR]HR_LWT 0.0 001 000 Reclaim Leaving Fluid [CR]hr_sp 104.0 001 000 Reclaim Fluid Setpoint [CR]sct_a_sp 118.4 001 000 Cir A SCT Control Point [CR]sct_b_sp 118.4 001 000 Cir B SCT Control Point [CR]pmpd_p_a 0.0 020 000 Cir A Pumpdown Pressure [CR]pmpd_p_b 0.0 020 000 Cir B Pumpdown Pressure [CR]hr_v_pos 20.0 003 000 HR Cond Valve Position [CR] 0 000 000 [CR] 0 000 000 RECLAIM DISCRETE PARAM [CR]RECL_SEL 0 000 000 Heat Reclaim Select [CR]condflow 0 000 000 Condenser Flow Status [CR]hr_val_a 0 000 000 Cir A Reclaim Valve Stat[CR]hr_val_b 0 000 000 Cir B Reclaim Valve Stat[CR]pd_val_a 0 000 000 A Pumpdown Valve Status [CR]pd_val_b 0 000 000 B Pumpdown Valve Status [CR]hrstat_a 0 000 000 Circuit A Reclaim Status[CR]hrstat_b 0 000 000 Circuit B Reclaim Status[CR]cond_htr 1 000 000 Reclaim Condenser Heater[CR] 0 000 000 OPERATING MODES [CR]Mode[07] 0 000 000 Startup Delay in effect [CR]Mode[08] 0 000 000 Second Setpoint in Use [CR]Mode[09] 0 000 000 Reset in Effect [CR]Mode[10] 0 000 000 Demand Limit Active [CR]Mode[11] 0 000 000 Ramp Loading Active [CR]Mode[12] 0 000 000 Low Source Protection [CR]Mode[13] 0 000 000 Low Cooler Suction Cir A[CR]Mode[14] 0 000 000 Low Cooler Suction Cir B[CR]Mode[15] 0 000 000 Low Dis Superheat Cir A[CR]Mode[16] 0 000 000 Low Dis Superheat Cir B[CR]Mode[17] 0 000 000 High Pres Override Cir A[CR]Mode[18] 0 000 000 High Pres Override Cir B[CR]Mode[19] 0 000 000 High Current Over Cir A [CR]Mode[20] 0 000 000 High Current Over Cir B [CR]Mode[21] 0 000 000 Reclaim Active? [CR]Mode[22] 0 000 000 Cooler Heater Active? [CR]Mode[23] 0 000 000 Cooler Pumps Rotation? [CR]Mode[24] 0 000 000 Pump Periodic Start? [CR]Mode[25] 0 000 000 Night Capacity Active? [CR]Mode[26] 0 000 000 System Manager Active? [CR]Mode[27] 0 000 000 Master Slave Active? [CR][CR]
//only 1st line is used

Appendix C. Driver Notes

Appendix C.1. Driver Limitations and Exclusions

The Carrier DataPort driver does not support the following functions. Send Data Periodically, Stop Sending, Xoff, Xon, Omit 24 Character description, Include 24 Character description, Read Configuration.

The Carrier DataPort driver is not capable of configuring the DataPort device. Software provided by the Carrier Corporation is required to do this. The DataPort device requires configuration, so that it connects to the appropriate CCN devices on the CCN communications network.

If the total length of the response from a read table query is more than 3000 bytes long, the driver will produce an error.

Appendix D. Driver Error Messages

The driver reports information and errors to you in the form of messages printed to the error log. Those messages marked with a * are only printed once even if they occur repeatedly.

Error Message	Explanation
CarrierDP:1 FYI. The MapDesc called <%s> is too short	The length of the Map Descriptor used to expose driver statistics is too short. Set the length to at least 1000 by editing the CSV file. Then reset the FieldServer. You can ignore this message if you wish – the driver will abandon statistics which require the length of the Map Descriptor to be increased.
CarrierDP:2 FYI. You could have used a MapDesc called <%s> to expose diagnostic info.	You can safely ignore this message. It is a prompt. Read Appendix D.1 of this manual for more information.
CarrierDP:3 Err. Illegal Node_ID=%d Valid=1..15	Valid node numbers are in the range 1 to 15 inclusive. Read section 4.3 for more information.*
CarrierDP:4 FYI. Address has no meaning. Best set to 0 MapDesc=<%s>	You can safely ignore this message. The address parameter is commonly used in FieldServer configurations but it has no meaning in the configuration of this driver. It is best to remove the parameter from the configuration or set its value to 0.*
CarrDP:#5 Err. DataPort is read only. No wrbc/x. MapDesc=<%s>	The Carrier DataPort device is read only. You cannot have a Map Descriptor which writes to the device. Delete the Map Descriptor or changing it to a read*
CarrDP:#6 Err. Fieldname max length =8. MapDesc=<%s>	You can use no more than 8 characters to define a field name and no more than 24 to define the field description.*
CarrDP:#7 Err. Field Desc. max length =%d. MapDesc=<%s>	
CarrierDP:8 Err. Length required. MapDesc=<%s>	The length parameter must be set in the configuration file and it must be set to a value greater than zero. Appendix A.3 provides additional information.*
CarrierDP:9 FYI. Duplicate state=<%s>. Value has been updated from=%d to=%d	You have specified a discrete state word in the configuration file which duplicates one already in the list. The driver uses the new value specified in the CSV file to replace the previous value. Thus it is possible to change the values for the driver's default discrete state words. You can safely ignore this message; it is for your information only.
CarrierDP:10 Err. No space. Driver rejects value state=<%s> value=%d	The driver has limited space to store discrete state keywords added in the configuration file. The maximum is 150 words including the driver's defaults. Remove some of the keywords you have added to the configuration file*
CarrierDP:11 FYI. User added value state=<%s> value=%d	You can safely ignore this message; it is for your information only. Each time a new discrete state word is added to the driver from the configuration file, the driver reports the new word and its value.
CarrierDP:12 Err. Length too short to store all. MD=<%s>	The driver reports that the read table command resulted in more variables being returned than you have reserved space for (with the length parameter). Increase the length parameter.*

* Correct the error by editing the configuration CSV file, downloading the corrected file to the FieldServer and then resetting the FieldServer.

* Correct the error by editing the configuration CSV file, downloading the corrected file to the FieldServer and then resetting the FieldServer.

Error Message	Explanation
CarrierDP:13 FYI. Diagnostic send error #1 response.	These messages are for FieldServer engineers. If any either is ever printed in the error log please call FieldServer support and report the message.
CarrierDP:14 FYI. Diagnostic cancelled slave response	
CarrDP:#15 Err. Field Units required. MapDesc=<%s>	A server side Map Descriptor requires that the Engineering units are defined. More information about this field is provided in section 0 and Appendix A.1
CarrDP:#16 FYI. Use DA_Byte_Name for server status values. MD=<%s>	This message may be safely ignored. It is provided for your information only. It reminds you that you can use a secondary Data Array connected to the server side Map Descriptor to store 'status' value which will be returned when the server is polled. This is an alternate way of allowing the driver to determine the 'status' values. More information on status values is provided in Appendix A.1
CarrDP:#17 FYI. Use DA_Byte_Name for 'status' value storage. MD=<%s>	This message may be safely ignored. It is provided for your information only. It reminds you that you can use a secondary Data Array connected to the Client side Map Descriptor to have the driver store 'status' value when a poll response is obtained. If this secondary array is not defined then the status values are ignored. More information on status values is provided in Appendix A.1
CarrDP:#18 FYI. Use DA_Float_Name for 'units' value storage. MD=<%s>	This message may be safely ignored. It is provided for your information only. It reminds you that you can use a secondary Data Array connected to the Client side Map Descriptor to have the driver store 'engineering units' values when a poll response is obtained. If this secondary array is not defined then the 'units' values are ignored. More information on 'units' values is provided in Appendix A.1
CarrDP:#19 Err. 'Table_Name' has no meaning. MapDesc=<%s>	On the Client side the parameters 'Table_Name' and 'Field_Name' have no meaning and must be removed from the Map Descriptor. *
CarrDP:#20 Err. 'Field_Name' has no meaning. MapDesc=<%s>	
CarrDP:#21 Err. 'On_String' required. MapDesc=<%s>	On the server side, each Map Descriptor must have these parameters defined. Read section 0 and review the example in section 1.1.1 for more information. *
CarrDP:#22 Err. 'Field_Name' required. MapDesc=<%s>	
CarrDP:#23 Err. 'Field_Desc' required. MapDesc=<%s>	
CarrDP:#24 Err. MD=<%s> discrete state word not recognized.	On the line immediately following this error the driver reports the response that generated the error. The driver will store a value that is the ASCII code for the first character of the discrete state reported. Identification of the unrecognized discrete state word as well as information on how to extend the list of recognized discrete state words is provided in Appendix A.4.1. *
CarrDP:#25 Err. This driver	The length of the response from each different Carrier device and for

* Correct the error by editing the configuration CSV file, downloading the corrected file to the FieldServer and then resetting the FieldServer.

Error Message	Explanation
works best with long timeouts.	each table is different. The driver does not know the length of the responses. The Carrier devices take some time between receiving a poll and sending a response. The amount of time is proportional to the length of the response (and hence, to the size of the table.) If the device takes too long the driver may timeout as the default timeout is 2.0 seconds. It is strongly recommended that you set the timeout to a large value (like 30 seconds) to start with. The effect of having a large timeout is to 1) allow the driver enough time to receive the response and 2) Increase the amount of time before the driver reports the timeout if there is a genuine timeout event.
CarrDP:#26 FYI. No data was stored for MD=%s	This message is printed when a response is received but the driver did not find any information in the response that it could use to store. If the problem occurs repeatedly then take a log and call tech Support after you have tried the following diagnostic steps. 1) Check connection stats – If bytes received per message is < 100 then it is likely that the device you are polling is not responding properly or that a port setting is invalid. Check the port settings.
CarrDP:#27 Err. Can't open slave.log	This message should only be printed in simulation mode (QA testing). If you see this message call Tech Support.
CarrDP:#28 FYI. Response was sent from slave.log (Hex file)	This message should only be printed in simulation mode (QA testing). If you see this message call Tech Support.
CarrDP:#29 Err. The input buffer has overflowed.	This message could be produced when the characters which signal the end of a response are missing and the next response is appended to the 1st in the input buffer. In such cases the buffer may overflow. This message is printed once and then suppressed. However each time the event occurs, the STREAMING stat is incremented by one. If the stat is produced rarely then you could assume that that an occasional corrupt/incomplete message has produced the error. If it occurs all the time, then assume that the response is too large to fit in the input buffer. Most FST drivers have an input buffer of 3080 bytes This driver has a buffer size of 16000 bytes. The buffer size is hard coded so you will need to capture a log and send an error report to FST.
CarrDP: #30	When parsing a response, the driver processes the response line by line. A single response may consist of a number of lines. Each line is terminated with a Carriage Return (CR). If a single CR is missing then the driver sees two lines as a single line. In versions prior to 1.03eA the driver used the line number as the offset, therefore values extracted from subsequent lines were stored at the incorrect offset. Now the driver ignores the corrupted line and advances the line counter by 2 continuing the parsing and storing of extracted values. The values associated with the corrupted response line are not updated. This is reflected in the line count stored at offset zero. The driver detects lines with missing CR's by checking the line length. If the driver senses that more than two or more consecutive CR's are missing then the driver abandons the parse and store and prints error #32. If different parts of the response have missing CR's message #31 will be printed more than once per response. There is no direct corrective action you can take. The errors arise from dropped bytes in the response. If the error occurs frequently you will need to check that the data transmission is not being adversely affected by noise.
CarrDP:#31 Err. Line has missing CR. Some data not stored	
CarrDP:#32 Err. Many missing CR's. Abandon store... MD=%s	

Error Message	Explanation
CarrDP:#33 Err. DataPort responded with Err=%d. Device=%s	There DataPort device responded but the response reports an error. The error number is printed in the message. The message also reports the name of the node that was polled. The following 6 errors are documented. For other errors contact the Carrier Vendor. #1 Invalid Command : The digit 1 returned as an error code means that the last ASCII character sent to the DATAPORT by the off-network device is not one that the DATAPORT recognizes as a command. #2 No Display Table : The digit 2 returned as an error code means that the off-network device has commanded the DATAPORT to transmit data from a controller that is properly configured in the DATAPORT, but the controller does not contain a point display table. #3 CCN Bus Communication Error: The digit 3 returned as an error code means that the DATAPORT cannot transmit data from the requested controller because a communication error occurred while the DATAPORT was acquiring data from that controller. #4 Database Full : The digit 4 returned as an error code means that the off-network device has commanded the DATAPORT to transmit data from a controller that is properly configured in the DATAPORT, but the controller is beyond the 900 point limit. For example, if controllers 1 through 10 each contain 90 points, a command for the DATAPORT to transmit data from controller 11, 12, 13, 14, or 15 will result in error code 4. #5 DATAPORT Busy : The digit 5 returned as an error code means that a static data update is in progress, preventing the DATAPORT from responding successfully to a Send Controller Data Command or a Send Data Periodically command. #6 Controller Not Configured : The digit 6 returned as an error code means that the off-network device has commanded the DATAPORT to transmit data from a controller that is not configured in the DATAPORT. For example, if only controllers 1 through 5 are configured in the DATAPORT, a command of 0 (Send Controller Data for Controller 15) will result in error code 6.
CarrDP:#99 Err. Cant open INI file for response.	This message should only be printed in simulation mode (QA testing). If you see this message call Tech Support.

Appendix D.1. Driver Stats

The driver reports statistics according to the FieldServer standards. The following notes describe some aspects of standard statistic reporting which are peculiar to this driver.

- All error responses from the Carrier DataPort device are recorded as PROTOCOL ERRORS,

In addition to the standard FieldServer communication statistics described above and in the FieldServer Instruction Manual, this driver can also expose some driver statistics by writing data to a Data Array. A special Map Descriptor is required. The driver recognizes the Map Descriptor by its name which must be "CarrierDP-stats".

The following example shows how this special Map Descriptor can be configured. You can copy this section of text directly into your CSV file.

```
Nodes
Node_Name    ,                  Station,                  Protocol
CarrDP_stats ,                  1       ,                 CarrierDP

Data_Arrays
Data_Array_Name    ,            Data_Format,              Data_Array_Length
DA_CARRIERDP_STATS ,            UINT32     ,              2000
```

```
Map_Descriptors
Map_Descriptor_Name,  Data_Array_Name   ,  Data_Array_Offset,  Function,  Node_Name ,  Length,
CarrierDP-Stats    ,  DA_CARRIERDP_STATS,  0                  ,  passive ,  CarrDP_stats,  500
```

When the driver sees this Map Descriptor it uses the Data Array DA_CARRIER_STATS (in this example) to store driver specific statistics. Only one of these Map Descriptors may be specified per FieldServer.

The driver stores the following data. The location in the Data Array is obtained by multiplying the port number by 50 and then using the location offset indicated in the table below.

Array Offset is based on Port Number								
P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**Description**
0	50	100	150	200	250	300	350	Available for future use
1	51	101	151	201	251	301	351	Available for future use
2	52	102	152	202	252	302	352	Available for future use
3	53	103	153	203	253	303	353	Available for future use
4	54	104	154	204	254	304	354	Number of bytes sent by Client driver
5	55	105	155	205	255	305	355	Number of messages sent by Client
6	56	106	156	206	256	306	356	Number of response messages received by Client
7	57	107	157	207	257	307	357	Available for future use
9	58	108	158	208	257	307	357	Most recent response error
8	59	109	159	210	260	310	360	Number of times Client receives an error response
10	60	110	160	210	260	310	360	Error #1 Invalid Command
11	61	111	161	211	261	311	361	Error #2 No Display Table
12	62	112	162	212	262	312	362	Error #3 CCN Bus Communication Error
13	63	113	163	213	263	313	363	Error #4 Database Full
14	64	114	164	214	264	314	364	Error #5 DATAPORT Busy
15	65	115	165	215	265	315	365	Error #6 Device Not Configured
16	66	116	166	216	266	316	366	Error #7
17	67	117	167	217	267	317	367	Error #8
18	68	118	168	218	268	318	368	Error #9
19	69	119	169	219	269	319	369	Error #10
20	70	120	170	220	270	320	370	Error #11
21	71	121	171	221	271	321	371	Error #12
22	72	122	172	222	272	322	372	Error #13
23	73	123	173	223	273	323	373	Error #14
24	74	124	174	224	274	324	374	Some other error
25	75	125	175	225	275	325	375	Number of response bytes received by Client
26	76	126	176	226	276	326	376	Number of times Client has timeout out waiting for (response)
27	77	127	177	227	277	327	377	Number of times Client prints a timeout SDO message.