A Sierra Monitor Company

Driver Manual
(Supplement to the FieldServer Instruction Manual)

FS-8700-31 Siemens TIWAY I

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after May 1, 2001

Driver Version	**1.01b**
Document revision	**Rev 1**

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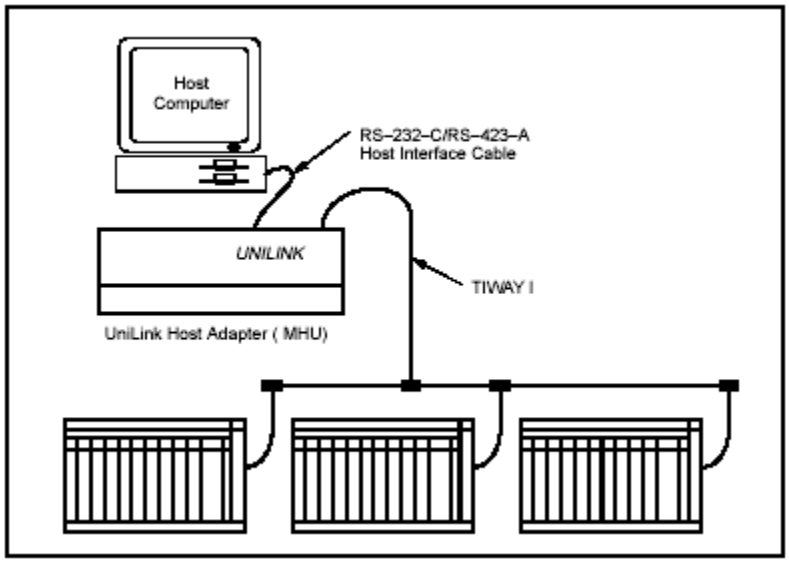
1. Siemens TIWAY I Driver Description

The Siemens TIWAY I driver allows the FieldServer to transfer data to and from devices over RS-232C using TIWAY BDLC "Host Adapter Command" protocol. The FieldServer can emulate either a Server or Client.

Max Nodes Supported

FieldServer Mode	Nodes	Comments
Client	1	Only 1 client node allowed
Server	254	Up to 254 secondary PLCs

The FieldServer Siemens TIWAY I driver, hereafter simply referred to as the TIWAY driver, can be used to emulate the host side of a Siemens Unilink Host Adaptor (UHA) using BDLC "Host Command Protocol". The original Siemens UHA device was used to interface other host devices to a TIWAY I network as shown below:



The original Siemens UHA is really a protocol bridge in itself. It speaks "Host Command Protocol" on the host interface which may contain embedded TIWAY primitives (commands) and speaks Siemens TIWAY I protocol on its secondary interface. The FieldServer TIWAY I driver emulates the UHA's host interface when used in the server mode, however the FieldServer does not speak Siemens TIWAY protocol and therefore cannot be used to connect to legacy TIWAY devices directly. The driver's use is primarily as a server to allow legacy SCADA systems speaking "Host Command Protocol" containing TIWAY primitives to communicate with modern PLCs speaking Modbus or other industrial protocols. The accompanying FieldServer client driver in a configuration setup will typically be Modbus or some other industrial protocol. The TIWAY driver's use as a client is limited to emulating a host to a UHA or for testing purposes.

The TIWAY driver operates in the Master Host Interface Unit (MHIU) mode and only supports a limited selected set of Host Adapter commands and TIWAY primitives which are

listed under the Supported Host Adaptor Commands and Primitives section of the driver factsheet.

2. Driver Scope of Supply

2.1. Supplied by FieldServer Technologies for this driver

FieldServer Technologies PART #	Description
FS-8915-10	UTP cable (7 foot) for Ethernet connection
FS-8915-10	UTP cable (7 foot) for RS232 use
FS-8917-02	RJ45 to DB9F connector adapter
FS-8917-01	RJ45 to DB25M connection adapter
-	Driver Manual.

2.2. Provided by the Supplier of 3rd Party Equipment

2.2.1. Hardware

Part #	Description

2.2.2. Required 3rd Party Software

SCADA TIWAY Unilink adapter client software such as Intellution's FIX driver.

2.2.3. Required 3rd Party Configuration

The BDLC protocol has to be selected on any 3rd party client.

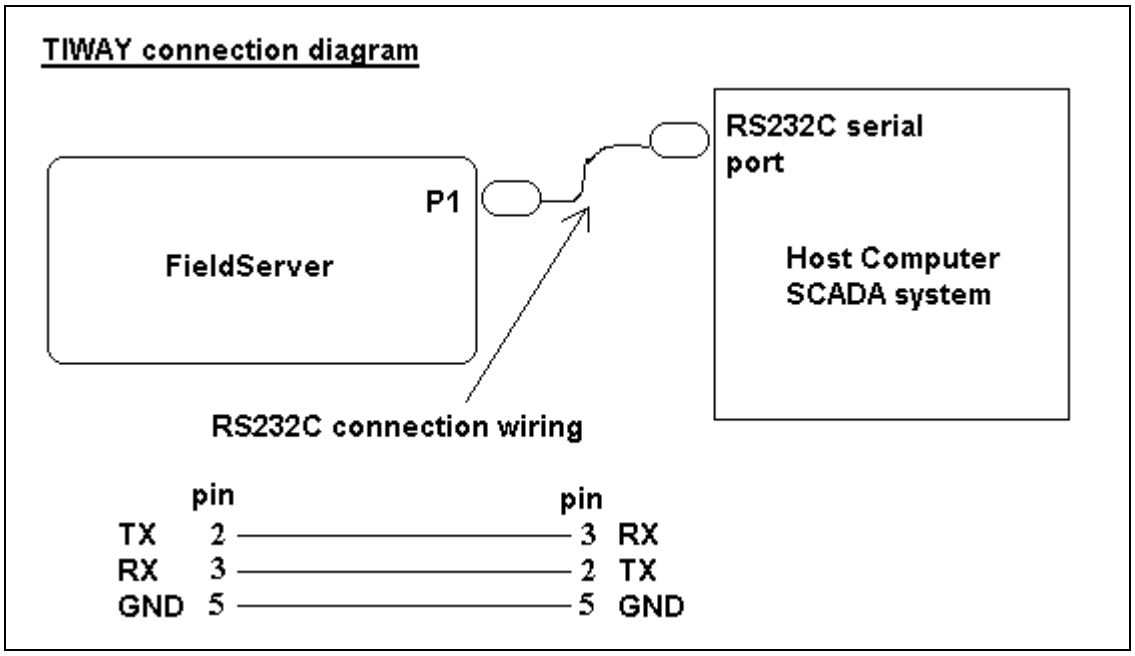
2.2.4. Optional Items

PART #	Vendor/Manufacturer	Description

3. Hardware Connections

The FieldServer is connected to the SCADA system as shown below.

Configure the SCADA system according to manufacturer's instructions.



3.1. Hardware Connection Tips / Hints

To be updated from testing feedback.

4. Configuring the FieldServer as a TIWAY Client

For a detailed discussion on FieldServer configuration, please refer to the FieldServer ~~instruction~~ Configuration ~~m~~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 FS).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a TIWAY Server. The driver is normally used in the server mode, but may be configured as a client for testing purposes.

4.1. Data Arrays/Descriptors

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for TIWAY 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.

Section Title
Data_Arrays

Column Title	Function	Legal Values
Data_Array_Name	Provide name for Data Array	Up to 15 alphanumeric characters
Data_Array_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 by the map descriptors for the data being placed in this array.	1-10,000

Example

```
//  Data Arrays

Data_Arrays
Data_Array_Name,    Data_Format,    Data_Array_Length,
RAW16_Data,         UInt16,         20
RAW8_Data,          Byte,           20
Float_Data,         Float,          20
```

4.2. Client Side Connection Descriptions

Section Title
Connections

Column Title	Function	Legal Values
Port	Specify which port the device is connected to the FieldServer	P1-P8
Protocol	Specify protocol used	TIWAY, TIWAY_BDLC
Baud*	Specify baud rate	110 – 115200, standard baudrates only
Parity*	Specify parity	Even, Odd, **None,** Mark, Space
Data_Bits*	Specify data bits	7, **8**
Stop_Bits*	Specify stop bits	**1**
Handshaking*	Specify hardware handshaking	RTS, RTS/CTS, **None**
Poll _Delay*	Time between internal polls	0-32000 seconds, **1 second**

Example

```
// Client Side Connections

Connections
Port,     Protocol,     Baud,   Parity,  Handshaking,  Poll_Delay
P1,       TIWAY_BDLC,   9600,   None,    None,         0.100s
```

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	Secondary PLC station address to communicate with	1-254
Protocol	Specify protocol used	TIWAY, TIWAY_BDLC
Connection	Specify which port the device is connected to the FieldServer	P1-P8

Example

```
// Client Side Nodes

Nodes
Node_Name,    Node_ID,    Protocol,     Port
PLC_01,       01,         TIWAY_BDLC,   P1
```

4.4. Client Side Map Descriptors

4.4.1. FieldServer Related Map Descriptor Parameters

Section Title		
Map Descriptors		
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_Offset	Starting location in Data Array	0 to maximum specified in “Data Array” section above
Function	Function of Client Map Descriptor	RDBC, WRBC, WRBX, AWT

4.4.2. Driver Related Map Descriptor Parameters

Section Title		
Map Descriptors		
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
TIWAY_Data_Type	Specifies fundamental datatype to address in PLC	**16-bit word datatypes** IE_Ladder Variable Constant Word_Input Word_Output Timer_Cnt_Preset Timer_Cnt_Current Drum_Count_Preset Loop_Status Status_Primitive **8-bit byte datatypes** Discrete_Input Discrete_Output Control_Register Discrete_Force Control_Register_Force Drum_Step_Preset Drum_Step_Current **32-bit float datatypes** Loop_Gain Loop_Reset Loop_Rate Loop_High_Alarm Loop_Low_Alarm Loop_Process_Variable Loop_High_Process_Variable Loop_Low_Process_Variable Loop_Orange_Deviation Loop_Yellow_Deviation Loop_Sample_Rate Loop_Set_Point

		Loop_Output **<u>24-bit datatypes</u>** Word_Force **<u>Packed-bit datatypes</u>** Discrete_Input_Packed Discrete_Output_Packed Control_Register_Packed
TIWAY_Host_Adapter_Cmd	Specifies a host adapter command to execute	Read_Secondary_Log Report_HIU_Config Report_Adapter_Config Report_NM_Config Soft_Reset Reset_Adapter Disconnect_Secondaries Connect_Secondaries
TIWAY_Address_List	A list of PLC memory addresses that may be used for random read and writes	0-65535 0-255 for loop datatypes and Drum_Count_Preset Maximum of 80 space seperated values allowed.
Preset_Step_List	A list of preset step values to be used with the Drum_Count_Preset datatype. Each value is tied to an address.	0-255 Maximum of 80 space seperated values allowed.
Secondaries_List	A list of secondary PLC addresses to be used with the Connect_ and Disconnect_Secondaries host adapter commands.	1-255 255 indicates all secondaries from 1 to 254
Address	Starting address of read or write block	0-65535 0-255 for loop datatypes and Drum_Count_Preset
Length	Length of Map Descriptor	1-65535

4.4.3. Timing Parameters

Section Title		
Map Descriptors		
Column Title	**Function**	**Legal Values**
Scan_Interval	Rate at which data is polled	≥0.001s

4.4.4. Reading TIWAY data map descriptor examples

4.4.4.1. Reading data from contiguous PLC data memory locations

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_name,	TIWAY_Data_Type,	Address,	Length,
C01_RAW16_PLC01,	RAW16_Data,	0,	RDBC,	PLC_01,	IE_Ladder,	0,	10,

Scan_Interval
0s

The above map descriptor will continuously read 10 data elements starting from address 0 of type “IE_Ladder” from PLC_01. The data will be stored in the data array called “RAW16_Data” from an offset of 0.

4.4.4.2. Reading data from random PLC data memory locations

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_name,	TIWAY_Data_Type,	TIWAY_Address_List,	Length,
C02_RAW16_PLC01,	RAW16_Data,	10,	RDBC,	PLC_01,	Variable,	5 9,	2,

Scan_Interval
0s

The above map descriptor will continuously read 2 data elements from address 5 and 9 of type “Variable” from PLC_01. The data will be stored in the data array called “RAW16_Data” from an offset of 10. The data will be stored at offsets 10 and 11.

4.4.4.3. Reading Drum_Count_Preset data from contiguous PLC data memory locations

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_name,	TIWAY_Data_Type,	Address,	Length,
C08_RAW16_PLC01,	RAW16_Data,	70,	RDBC,	PLC_01,	Drum_Count_Preset,	0,	5,

```
Preset_Step_List,    Scan_Interval
5 8 9 33 49,         0s
```

The above map descriptor will continuously read 5 data elements from addresses 0-4 of type "Drum_Count_Preset" from PLC_01. The Preset Steps associated with addresses are (address 0):5, (address 1):8, (address 2):9, (address 3):33, and (address 4):49. The data will be stored contiguously in the data array from offset 70.

4.4.4.4. Reading Drum_Count_Preset data from random PLC data memory locations

```
Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_name,  TIWAY_Data_Type,  TIWAY_Address_List,
C08_RAW16_PLC01,      RAW16_Data,       75,                 RDBC,      PLC_01,     Drum_Count_Preset,  5 9,

Length,  Preset_Step_List,  Scan_Interval
2,       42 22,             0s
```

The above map descriptor will continuously read 2 data elements from addresses 5 and 9 of type "Drum_Count_Preset" from PLC_01. The Preset Steps associated with addresses are (address 5):42 and (address 9):22. The data will be stored in the data array at offset 75 and 76.

4.4.4.5. Reading secondary PLC status

```
Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_name,  TIWAY_Data_Type,     Length,  Scan_Interval
C36_STATUS_PRIM,      Status,           0,                  RDBC,      PLC_01,     Status_Primitive,   3,       0s
```

The above map descriptor will continuously read the three status values from PLC_01. The status values are defined as follows and will be stored in the data array contiguously from an offset of zero:

Status element 1 (DD) : Operational Status

Status element 2 (EE) : Auxiliary power source status

Status element 3 (FF) : NIM Operational Status

Please refer to the TIWAY systems manual for operational values and their meanings.

4.4.5. Writing TIWAY data map descriptor examples

4.4.5.1. Writing data to contiguous PLC data memory locations

```
 Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_name,  TIWAY_Data_Type,  Address,  Length,
C12_RAW8_PLC07,  RAW8_Data,  20,  WRBC,  PLC_07,  Control_Register,  0,  10,

Scan_Interval
0s
```

The above map descriptor will continuously write data of type “Control_Register” to 10 PLC data memory addresses. The data to write will be collected from the data array “RAW8_Data” from an offset of 20.

4.4.5.2. Writing data to random PLC data memory locations

```
Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_name,  TIWAY_Data_Type,  TIWAY_Address_List,  Length,
C17_FLOAT_PLC254,  FLOAT_Data,  0,  WRBC,  PLC_254,  Loop_Gain,  5 9,  2,

Scan_Interval
0s
```

The above map descriptor will continuously write data of type “Loop_Gain” to 2 PLC data memory addresses of 5 and 9. The data to write will be collected from the data array “FLOAT_Data” from offsets 0 and 1.

4.4.5.3. Writing the same value to a block of contiguous PLC data memory locations

```
Map_Descriptor_Name,    Data_Array_Name,    Data_Array_Offset,    Function,    Node_name,    TIWAY_Data_Type,    Address,    Length,
C18_FLOAT_PLC254,       FLOAT_Data,         10,                   WRBC,        PLC_254,      Loop_Reset,         0,          3,

TIWAY_Fill_Block_Value,    Scan_Interval
50.5,                      0s
```

The above map descriptor will continuously write a value of 50.5 of type “Loop_Reset” to 3 contiguous PLC data memory addresses starting from 0.

4.4.5.4. Writing Drum_Count_Preset data to contiguous PLC data memory locations

```
Map_Descriptor_Name,    Data_Array_Name,    Data_Array_Offset,    Function,    Node_name,    TIWAY_Data_Type,    Address,    Length,
C08_RAW16_PLC01,        RAW16_Data,         70,                   WRBC,        PLC_01,       Drum_Count_Preset,  0,          5,

Preset_Step_List,    Scan_Interval
5 8 9 33 49,         0s
```

The above map descriptor will continuously write data of type “Drum_Count_Preset” to 5 PLC data memory addresses. The data to write will be collected from the data array “RAW16_Data” from an offset of 70. The Preset Steps associated with the addresses are (address 0):5, (address 1):8, (address 2):9, (address 3):33, and (address 4):49.

4.4.5.5. Writing Drum_Count_Preset data to random PLC data memory locations

```
Map_Descriptor_Name,    Data_Array_Name,    Data_Array_Offset,    Function,    Node_name,    TIWAY_Data_Type,    TIWAY_Address_List,
C08_RAW16_PLC01,        RAW16_Data,         70,                   WRBC,        PLC_01,       Drum_Count_Preset,  5 9,

Length,    Preset_Step_List,    Scan_Interval
```

2, 33 49, 0s

The above map descriptor will continuously write data of type “Drum_Count_Preset” to 2 PLC data memory addresses. The data to write will be collected from the data array “RAW16_Data” from an offset of 70 and 71. The Preset Steps associated with the addresses are (address 5):33 and (address 9):49.

4.4.6. TIWAY host adapter command map descriptor examples

A number of map descriptors that send specific host adapter commands are available mainly for testing purposes and should not be used under normal circumstances.

4.4.6.1. Read Secondary Log

Returns a list of secondary PLC stations addresses that are connected.

```
Map_Descriptor_Name,    Data_Array_Name,    Data_Array_Offset,    Function,    Node_name,    TIWAY_Host_Adapter_Cmd,    Length,
C37_READ_SEC_LOG,       Secondary_Log,      0,                    RDBC,        PLC_01,       Read_Secondary_Log,        254,

Scan_Interval
0s
```

The above map descriptor will continuously execute the indicated host adapter command and will store the list of connected secondary PLCs in the data array “Secondary Log” from an offset of 0. Offset 0 will correspond to secondary address 1, offset 1 to secondary 2 up to offset 253 corresponding to secondary address 254.

4.4.6.2. Report HIU Configuration

Reports the HIU Configuration option values that was used to configure the HIU.

```
Map_Descriptor_Name,    Data_Array_Name,    Data_Array_Offset,    Function,    Node_name,    TIWAY_Host_Adapter_Cmd,    Length,
C38_REP_HIU_CONFIG,     HIU_Config,         0,                    RDBC,        PLC_01,       Report_HIU_Config,         5,

Scan_Interval
0s
```

The above map descriptor will continuously execute the indicated host adapter command and will store the following parameter values in the data array “HIU_Config”:

Offset	*Parameter*
0	Dipswitch 1 and 2 settings
1	Config flag (0 = HIU not configured, 1 = HIU configured)
2	Option 01 configuration value
3	Option 02 configuration value
4	Option 03 configuration value

4.4.6.3. Report Adapter Configuration

Reports the Adapter Configuration option values that was used to configure the adapter.

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_name,	TIWAY_Host_Adapter_Cmd,	Length,
C39_REP_ADAP_CONFIG,	Adapter_Config,	0,	RDBC,	PLC_01,	Report_Adapter_Config,	6,

Scan_Interval
0s

The above map descriptor will continuously execute the indicated host adapter command and will store the following parameter values in the data array “Adapter_Config”:

Offset	*Parameter*
0	Dipswitch 1 and 2 settings
1	Config flag (0 = Adapter not configured, 1 = Adapter configured)
2	Option 01 configuration value
3	Option 02 configuration value
4	Option 03 configuration value
5	Option 04 configuration value

4.4.6.4. Report Network Manager Configuration

Reports the Network Manager option values that was used to configure the network manager.

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_name,	TIWAY_Host_Adapter_Cmd,	Length,

```
C40_REP_NM_CONFIG,    Nm_Config,    0,    RDBC,    PLC_01,    Report_NM_Config,    16,
Scan_Interval
0s
```

The above map descriptor will continuously execute the indicated host adapter command and will store the following parameter values in the data array “Nm_Config”:

Offset	*Parameter*
0	Dipswitch 1 and 2 settings
1	Config flag (0 = Network Manager not configured, 1 = Network Manager configured)
2	Option 01 configuration value
3	Option 02 configuration value
4	Option 03 configuration value
5	Option 04 configuration value
6	Option 05 configuration value
7	Option 06 configuration value
8	Option 07 configuration value
9	Option 08 configuration value
10	Option 09 configuration value
11	Option 0A configuration value
12	Option 0B configuration value
13	Option 0C configuration value
14	Option 0D configuration value
15	Option 0E configuration value

4.4.6.5. Soft Reset

Forces the UNILINK Host Adapter to do a software reset.

```
Map_Descriptor_Name,    Data_Array_Name,    Data_Array_Offset,    Function,    Node_name,    TIWAY_Host_Adapter_Cmd,    Length
C41_SOFT_RESET,         Cmd_Triggers,       0,                    AWT,         PLC_01,       Soft_Reset,                1
```

The above map descriptor will execute the indicated host adapter command once every time a value is written to the data array “Cmd_Triggers” at offset 0.

4.4.6.6. Reset Adapter

Forces the UNILINK Host Adapter to do a hardware reset.

```
Map_Descriptor_Name,    Data_Array_Name,  Data_Array_Offset,  Function,  Node_name,  TIWAY_Host_Adapter_Cmd,  Length
C42_RESET_ADAPTER,      Cmd_Triggers,     1,                  AWT,       PLC_01,     Reset_Adapter,          1
```

The above map descriptor will execute the indicated host adapter command once every time a value is written to the data array “Cmd_Triggers” at offset 1.

4.4.6.7. Disconnect Secondaries

Disconnect Secondary PLCs from the network.

```
Map_Descriptor_Name,    Data_Array_Name,  Data_Array_Offset,  Function,  Node_name,  TIWAY_Host_Adapter_Cmd,  Length,
C43_DISC_SECDS,         Cmd_Triggers,     2,                  AWT,       PLC_01,     Disconnect_Secondaries,  1,

Secondaries_List
1 9 147 254
```

The above map descriptor will execute the indicated host adapter command once every time a value is written to the data array “Cmd_Triggers” at offset 2. Secondaries 1 9 147 and 254 will be disconnected from the network.

To disconnect all secondaries, use only one value of 255 in the Secondaries_List field.

4.4.6.8. Connect Secondaries

Disconnect Secondary PLCs from the network.

```
Map_Descriptor_Name,    Data_Array_Name,  Data_Array_Offset,  Function,  Node_name,  TIWAY_Host_Adapter_Cmd,  Length,
C45_CONNECT_SECDS,      Cmd_Triggers,     4,                  AWT,       PLC_01,     Connect_Secondaries,     1,

Secondaries_List
1 9 147 254
```

The above map descriptor will execute the indicated host adapter command once every time a value is written to the data array “Cmd_Triggers” at offset 4. Secondaries 1 9 147 and 254 will be connected to the network.

To connect all secondaries, use only one value of 255 in the Secondaries_List field.

5. Configuring the FieldServer as a TIWAY Server

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

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

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for TIWAY 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. Server Side Connection Descriptors

Section Title		
Connections		
Column Title	**Function**	**Legal Values**
Port	Specify which port the device is connected to the FieldServer	P1-P8
Protocol	Specify protocol used	TIWAY, TIWAY_BDLC
Baud*	Specify baud rate	110 – 115200, standard baud rates only
Parity*	Specify parity	Even, Odd, **None,** Mark, Space
Data_Bits*	Specify data bits	7, **8**
Stop_Bits*	Specify stop bits	**1**
Handshaking*	Specify hardware handshaking	RTS, RTS/CTS, **None**
Server_Hold_Timeout*	Specifies time FieldServer will reserve server side connection while waiting for the Client side to update data in Data_Array (if necessary)	>1.0s

Example

```
//      Server Side Connections

Connections
Port,           Protocol,       Baud,       Parity,     Handshaking,
P1,             TIWAY_BDLC,     9600,       None,       None,
```

5.2. 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	Secondary PLC station address of physical server node	1-254
Protocol	Specify protocol used	TIWAY, TIWAY_BDLC
Server_Hold_Timeout*	Specifies time FieldServer will reserve server side connection while waiting for the Client side to update data in Data_Array (if necessary)	>1.0s

Example

```
//  Server Side Nodes

Nodes
Node_Name,      Node_ID,        Protocol
PLC_01,         01,             TIWAY_BDLC
```

* Note that no connection information such as the Port is necessary on Server side.

5.3. Server Side Map Descriptors

5.3.1. FieldServer Specific Map Descriptor Parameters

Section Title		
Map Descriptors		
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_Offset	Starting location in Data Array	0 to maximum specified in "Data Array" section above
Function	Function of Server Map Descriptor	Server
Server_Hold_Timeout*	Specifies time FieldServer will reserve server side connection while waiting for the Client side to update data in Data_Array (if necessary)	>1.0s

5.3.2. Driver Specific Map Descriptor Parameters

Section Title		
Map Descriptors		
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
TIWAY_Data_Type	Specifies fundamental datatype represented by the PLC	**16-bit word datatypes** IE_Ladder Variable Constant Word_Input Word_Output Timer_Cnt_Preset Timer_Cnt_Current Drum_Count_Preset Loop_Status Status_Primitive **8-bit byte datatypes** Discrete_Input Discrete_Output

		Control_Register Discrete_Force Control_Register_Force Drum_Step_Preset Drum_Step_Current **32-bit float datatypes** Loop_Gain Loop_Reset Loop_Rate Loop_High_Alarm Loop_Low_Alarm Loop_Process_Variable Loop_High_Process_Variable Loop_Low_Process_Variable Loop_Orange_Deviation Loop_Yellow_Deviation Loop_Sample_Rate Loop_Set_Point Loop_Output **24-bit datatypes** Word_Force **Packed-bit datatypes** Discrete_Input_Packed Discrete_Output_Packed Control_Register_Packed
Preset_Step_List	A list of preset step values to be used with the Drum_Count_Preset datatype. Each value is tied to an address.	0-255 Maximum of 80 space seperated values allowed.
Address	Starting address of read or write block	0-65535 0-255 for loop datatypes and Drum_Count_Preset
Length	Length of Map Descriptor	1 - 65535

5.3.3. Serving TIWAY data map descriptor example

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_name,	TIWAY_Data_Type,	Address,	Length
S01_RAW16_PLC0,	RAW16_Data,	0,	Server,	PLC_01,	IE_Ladder,	0,	10

The above map descriptor serves 10 data elements starting from address 0 of type “IE_Ladder” for PLC_01.

5.3.4. Serving Drum_Count_Preset TIWAY data map descriptor example

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_name,	TIWAY_Data_Type,	Address,	Length,
S10_RAW16_PLC01,	RAW16_Data,	71,	Server,	PLC_01,	Drum_Count_Preset,	0,	4,

Preset_Step_List
3 5 9 167

The above map descriptor serves 4 data elements starting from address 0 of type “Drum_Count_Preset” for PLC_01. Each address location is contiguously associated with a preset step value from the Preset_Step_List field.

5.3.5. Serving PLC status data map descriptor example

Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node_name,	TIWAY_Data_Type,	Length
S36_PRIM_STATUS,	Status,	0,	Server,	PLC_01,	Status_Primitive,	3

The above map descriptor serves 3 status data elements for PLC_01 in the data array “Status” starting from offset 0.

6. Advanced Topics

None.

7. Driver Notes

None.

8. Troubleshooting tips

8.1. Connection Tips & Hints

None.

Revision History

Date	Driver Version	Document Revision	Resp	Comment
04/24/03	1.00a	0	DR	Created
8/13/03	1.00a	1	JD	Format Changes
11/20/03	1.00a	2	JD	Formatting Changes