



A Sierra Monitor Company

Driver Manual
(Supplement to the FieldServer Instruction Manual)

FS-8704-07 ALLEN BRADLEY PCCC (TCP/IP)

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after February 2012

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1 ALLEN BRADLEY ALLEN BRADLEY PCCC (TCP/IP) DESCRIPTION

The Allen Bradley PCCC (TCP/IP) driver allows the FieldServer to transfer data to and from devices over Allen Bradley PCCC (TCP/IP) Ethernet protocol. The FieldServer can emulate either a Server or Client.

The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer.

2 HARDWARE/SOFTWARE

2.1 Supplied by FieldServer Technologies for this Driver

FieldServer Technologies PART #	Description
FS-8915-10	Ethernet cable (7 foot)
FS-8704-07	Driver Manual

2.2 Provided by Supplier of 3rd Party Equipment

PART #	Description
	Allen Bradley PCCC (TCP/IP) compatible PLC, e.g. SLC5/05 etc. ¹
	Allen Bradley PCCC (TCP/IP) Client, e.g. Wonderware, Intellution FIX, GE Cimplicity, etc. ²

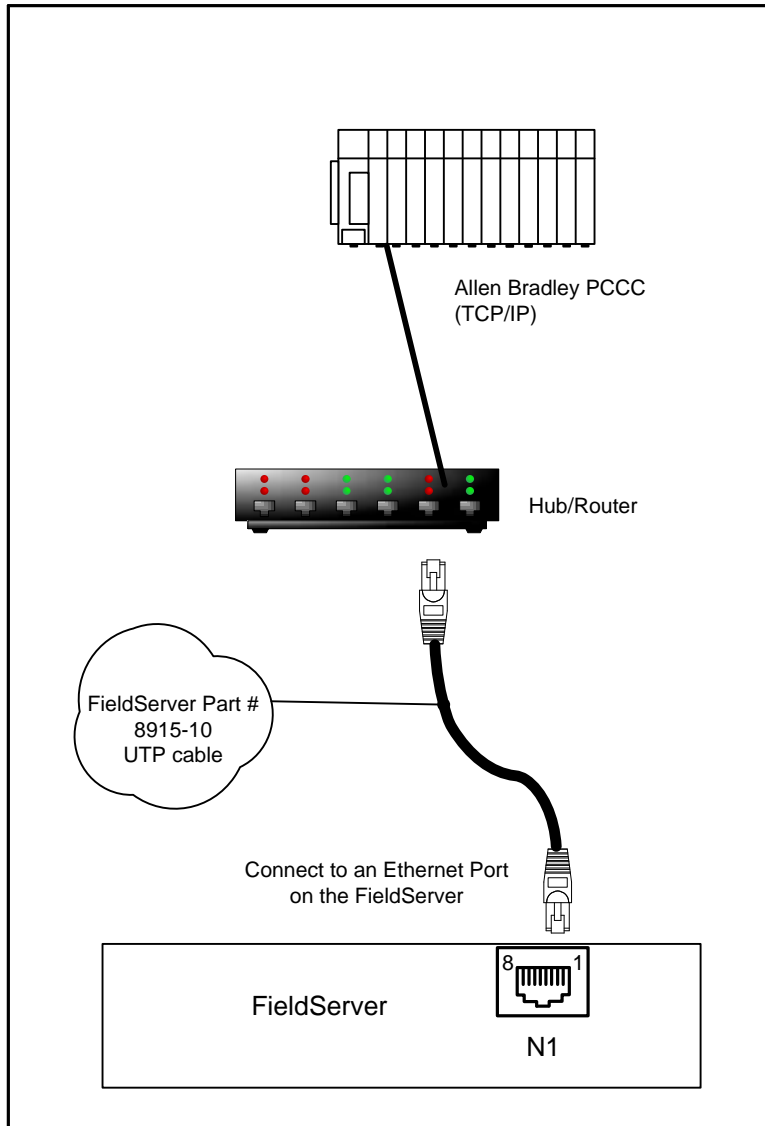
¹ If FieldServer used as Allen Bradley Allen Bradley PCCC (TCP/IP) Client

² If FieldServer used as Allen Bradley Allen Bradley PCCC (TCP/IP) Server.

3 HARDWARE CONNECTIONS

Make sure the device IP_address is configured to be on the same IP network as the FieldServer. Use a crossover cable if the FieldServer is connected directly to the PLC device. Use a straight cable if the FieldServer is connected to a hub.

Configure the PLC according to manufacturer's instructions



4 DATA ARRAY PARAMETERS

Data Arrays are “protocol neutral” data buffers for storage of data to be passed between protocols. It is necessary to declare the data format of each of the Data Arrays to facilitate correct storage of the relevant data.

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.	Int16, Int32, Bit, Float
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_Array_Format , Data_Array_Length
DA_AI_01        , Float           , 200
DA_AO_01        , Float6         , 200
DA_DI_01        , Bit            , 200
DA_DO_01        , Bit            , 200
```

5 CONFIGURING THE FIELDSEVER AS AN ALLEN BRADLEY PCCC (TCP/IP) CLIENT

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 an Allen Bradley PCCC (TCP/IP) Server.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for Allen Bradley PCCC (TCP/IP) 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.

5.1 Client Side Connection Parameters

Section Title		
Connections		
Column Title	Function	Legal Values
Adapter	Specify which port the device is connected to the FieldServer	N1
Protocol	Specify protocol used	AB_CSP, AB_TCP

Example

```
// Client Side Connections

Connections
Adapter          , Protocol
N1                , AB_CSP
```

5.2 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	Node ID of physical server node (PLC)	0-255
IP_Address*	IP address of physical server node (PLC). Must be on the same subnet as the server or gateway	IP address e.g , 192.168.2.1, -
Protocol	Specify protocol used	AB_CSP, AB_TCP
Adapter	Specify on which port the device is connected to the FieldServer	N1
PLC_Type	Specify PLC Communications type.	PLC3, PLC5, SLC5

Example

```
// Client Side Nodes

Nodes
Node_Name , Node_ID , Protocol , PLC_Type , IP_Address , Adapter
PLC_01 , 1 , AB_CSP , SLC5 , 192.168.1.13 , N1
```

5.3 Client Side Map Descriptors Client Side Map Descriptors

5.3.1 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 Section 4.
Data_Array_Offset	Starting location in Data Array	0 to (Data_Array_Length -1) as specified in Section 4
Function	Function of Client Map Descriptor	Rdbc, Wrbc, Wrbx

5.3.2 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 Section 5.2
File_Type	File type in PLC	N, B, F, I, O, S ³
File_Number	File Number in PLC	0-65535 ⁴
Address	Starting address of read block	0-255
Data_Array_Low_Scale*	Scaling zero in Data Array	-32767 to 32767, 0
Data_Array_High_Scale*	Scaling max in Data Array	-32767 to 32767, 100
Node_Low_Scale*	Scaling zero in Connected Node	-32767 to 32767, 0
Node_High_Scale*	Scaling max in Connected Node	-32767 to 32767, 100
AB_Command	Override the default command	Unprotected Command Typed

³ Not all PLC's can support all File_Types. Refer to DFS for further information.

⁴ Other device might not be supporting the full range, e.g. SLC5 supports only 0-255 and latest PLC5 till now supports only 0-1999

5.3.3 Map Descriptor Example

```
// Client Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name , File_Type , File_Number , Address , Length , Scan_Interval
CMD_AI_01 , DA_AI_01 , 0 , Rdbc , PLC_01 , N , 10 , 0 , 16 , 1.0s
CMD_AO_01 , DA_AO_01 , 0 , Rdbc , PLC_01 , N , 11 , 0 , 16 , 1.0s

Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name , File_Type , File_Number , Address , Length , Scan_Interval
CMD_DI_01 , DA_DI_01 , 0 , Rdbc , PLC_01 , B , 12 , 0 , 16 , 1.0s
CMD_DO_01 , DA_DO_01 , 0 , Rdbc , PLC_01 , B , 13 , 0 , 16 , 1.0s
```

update File_Number in section 4.4.2 and 5.3.2 limit should be 0-65535

along with a note that "Other device might not be supporting the full range, e.g. SLC5 supports only 0-255 and latest PLC5 till now supports only 0-1999"

6 CONFIGURING THE FIELDSEVER AS AN ALLEN BRADLEY PCCC (TCP/IP) SERVER

6.1 Server Side Connection Descriptors

Section Title		
Connections		
Column Title	Function	Legal Values
Adapter	Specify which port the device is connected to the FieldServer	N1
Protocol	Specify protocol used	AB_CSP, AB_TCP
IP_Address*	Virtual IP address of FieldServer. Must be on the same subnet as the Client or Gateway.	IP address e.g , 192.168.2.1, -

Example

```
// Server Side Connections

Connections
Adapter      , Protocol  , IP_address
N1           , AB_CSP   , 192.168.2.1
```

6.2 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	Node ID of physical server node	0-255
Protocol	Specify protocol used	AB_CSP, AB_TCP
PLC_Type	Specify PLC Communications type.	PLC3, PLC5, SLC5

Example

```
// Server Side Nodes

Nodes
Node_Name  , Node_ID  , Protocol  , PLC_Type
ABE_Srv_11 , 11       , AB_CSP   , SLC5
```

6.3 Server Side Map Descriptors

6.3.1 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 Section 4.
Data_Array_Offset	Starting location in Data Array	0 to (Data_Array_Length -1) as specified in Section 4
Function	Function of Client Map Descriptor	Passive

6.3.2 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 Section 6.2
File_Type	File type in PLC	N, B, F, I, O, S ⁵
File_Number	File Number in PLC	0-65535 ⁶
Address	Starting address of read block	0 - 255
Data_Array_Low_Scale*	Scaling zero in Data Array	-32767 to 32767, 0
Data_Array_High_Scale*	Scaling max in Data Array	-32767 to 32767, 100
Node_Low_Scale*	Scaling zero in Connected Node	-32767 to 32767, 0
Node_High_Scale*	Scaling max in Connected Node	-32767 to 32767, 100

⁵ Not all PLC's can support all File_Types. Refer to DFS for further information.

⁶ Other device might not be supporting the full range, e.g. SLC5 supports only 0-255 and latest PLC5 till now supports only 0-1999

6.3.3 Map Descriptor Example

```
// Client Side Map descriptors

Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name , File_Type , File_Number , Address , Length , Data_Array_Low_Scale , Data_Array_High_Scale , Node_Low_Scale , Node_High_Scale
SMD_AI_01 , DA_AI_01 , 0 , Passive , ABE_Srv_11 , N , 10 , 0 , 16 , 0 , 100 , 0 , 100
SMD_AO_01 , DA_AO_01 , 0 , Passive , ABE_Srv_11 , N , 11 , 0 , 16 , 0 , 100 , 0 , 100

Map_Descriptors
Map_Descriptor_Name , Data_Array_Name , Data_Array_Offset , Function , Node_Name , File_Type , File_Number , Address , Length
SMD_DI_01 , DA_DI_01 , 0 , Passive , ABE_Srv_11 , B , 12 , 0 , 16
SMD_DO_01 , DA_DO_01 , 0 , Passive , ABE_Srv_11 , B , 13 , 0 , 16
```

Appendix A. Troubleshooting

Appendix A.1. Continuous Map Descriptors

The Driver is not able to split data between 2 Data Arrays when writing, or to read a Server mapping that is discontinuous.

For example, on the Server Side:

If:

Server map 1: N21: 0-31

Server map 2: N21: 32-100

This will panic the FieldServer and crash RS view as the DH+ will attempt to map N21: 0-100. If set up as Server Map 1: N21: 0-100, no problems are experienced.

Appendix A.2. Reading B File Types

It is advisable to read all data from one B type file into the same data array in one contiguous read if possible. Doing otherwise may result in problems when reading these points.

Appendix A.3. Station Address

AB Message block does not allow for setting of Station address, therefore Node_ID must be set to 0.

Appendix B. Vendor Information

Appendix B.1. Set up of FieldServer in RS Linx.

- Run up rslinx
- Click Communications->Configure Drivers
- Select Ethernet Devices (from the "Available Driver Types" pulldown)
- Select "Add New"
- Select the station you want to talk to. Press "Add New" button and "a"
- A new Driver called "AB_ETH-1 A-B Ethernet" is added as a station number
- Close the "Configure Devices" window
- Press "Display Station Browser" icon
- See that your device is discovered

Task Complete

Appendix C. Reference

Appendix C.1. Command Support

The following commands are supported by the FieldServer for the various PLC types:

PLC_Type	File_Type	FNC	Read	FNC	Write	Typical Command
PLC3	N	1	Range Read	0	Range Write	N7: 3, L5
	F	1	Range Read	0	Range Write	F12: 3, L5
	B	1	Range Read	2	Bit Write	B3/4: 5, I5
PLC5	N	1	Range Read	0	Range Write	N7: 3, L5
	F	1	Range Read	67	Typed Write	F12: 3, L5
	B	1	Range Read	26	Read Modify Write	B3/4: 5, L5
SLC5	N	A2	Protected Typed Logical Read	AA	Protected Typed Logical Write	N7: 3, L5
	F	A2	Protected Typed Logical Read	AA	Protected Typed Logical Write	B3/4: 5, L7
	B	A2	Protected Typed Logical Read	AB	Protected Typed Logical Write	B3/4: 5, L8
	I	A2	Protected Typed Logical Read	-	-	I: 13, L5
	O	A2	Protected Typed Logical Read	-	-	O: 13, L5
	S	A2	Protected Typed Logical Read			52: 3, L5

Appendix C.2. Error Messages

Error Message	Description and Action
AB_TCP:#1 Err. Cant connect to %s. Recovery_Interval begins..	This message is printed if the driver cannot open a TCP connection to the remote Node. In this case the Node is put offline immedialy and the recovery_interval (default 30 seconds) begins. This message is typically printed when the remote AB_TCP node is not connected to the network or is unreachable.