FieldServer
Technologies

A Sierra Monitor Company

Driver Manual
(Supplement to the FieldServer Instruction Manual)

FS-8704-10 TL1

APPLICABILITY & EFFECTIVITY

Effective for all systems manufactured after May 1, 2001

Driver Version:	1.01
Document Revision:	2

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1. TL1 Description

The TL1 driver allows the FieldServer to control devices and generate alarms as a TL1 Network Element. The control allows digital and analog inputs to be read and written by the FieldServer. The alarms can generate automatic commands, or the FieldServer can respond to input commands generated by a TL1 Monitoring Client. The FieldServer emulates a Server with this driver.

Normally, the FieldServer will emulate an Environmental Monitor. Alarm Types will be chosen from the Environmental Alarm Types specified in the "NE Transport Surveillance Messages" Document (GR-833-CORE). The FieldServer supports multiple target identifiers (TID's), and multiple access identifiers (AID's). Both are specified from 1 to 255 which allows the FieldServer to report multiple (255) different alarms of each type such as AIRCOMPR or FIRE or POWER.

The information that follows describes how to set up alarms and controls to be monitored with the TL1 system.

2. Driver Scope of Supply

2.1. Supplied by FieldServer Technologies for this driver

FieldServer Technologies PART #	Description
FS-8917-10	UTP cable (7 foot) for RS-232 use
FS-8917-02	RJ45 to DB9F connector adapter
FS-8917-01	RJ45 to DB25M connection adapter
FS-8917-21	RS-485 connection adapter
FS-8704-10	Driver Manual.

2.2. Provided by the Supplier of 3rd Party Equipment

2.2.1. Hardware

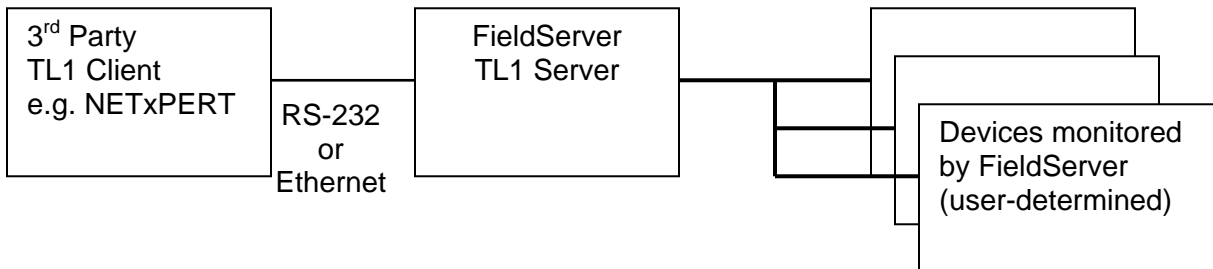| Part #	Description
	TL1 Client Workstation

3.   Hardware Connections

The FieldServer is connected to the TL1 as shown in connection drawing.

Configure the TL1 according to manufacturer's instructions

Serial/Ethernet Configuration

3.1.   Connection Notes

The Ethernet option requires the FieldServer Telnet driver (FS8704-11) to be purchased in addition to the TL1 driver.

4.   Configuring the FieldServer to monitor TL1 alarms and controls

For each control or alarm that can be accessed by the TL1 Client, a Map Descriptor must be added to the TL1 Server driver. The Map Descriptor provides the information to be reported to the TL1 Server as well as a Data Array point to be monitored to determine when an alarm should occur. The data point can be either a bit or a 16-bit integer that is controlled by the other driver running on the FieldServer. When this point becomes non-zero, the TL1 driver will report an alarm and when it reverts to zero, the TL1 driver will report the clearing of the alarm.

Each Map Descriptor must have a name. This name field corresponds to the Alarm Type reported by the TL1 driver. In this manner, any valid FieldServer Map Descriptor name could be used as a TL1 alarm type. Typical values would be:

Alarm Type	Description	Alarm Type	Description
AIRCOMPR	Air compressor failure	HIWTR	High water
AIRCOND	Air conditioning failure	INTRUDER	Intrusion
AIRDRYR	Air dryer failure	LWBATVG	Low battery voltage
BATDSCHRG	Battery discharging	LWFUEL	Low fuel
BATTERY	Battery failure	LWHUM	Low humidity
CLFAN	Cooling fan failure	LWPRES	Low cable pressure
CPMAJOR	Centralized power major failure	LWTEMP	Low temperature
CPMINOR	Centralized power minor failure	LWWTR	Low water
ENGINE	Engine failure	MISC	Miscellaneous
ENGOPRG	Engine operating	OPENDR	Open door
EXPLGS	Explosive gas	PUMP	Pump failure
FIRDETR	Fire detector failure	POWER	Commercial power failure
FIRE	Fire	PWR-x	x Volt power supply failure
FLOOD	Flood	RECT	Rectifier failure
FUSE	Fuse failure	RECTHI	Rectifier high voltage
GEN	Generator failure	RECTLO	Rectifier low voltage
HIAIR	High airflow	SMOKE	Smoke detected
HIHUM	High humidity	TOXICGAS	Toxic gas
HITEMP	High temperature	VENTN	Ventilation system failure

Alarms must also have a message. These are specified in the Map Descriptor under the TL1_Message heading.

By default, alarms are reported as critical alarms. This can be changed by a command from the network (SET-ATTR-ENV) or by modifying the Map Descriptor. The starting notification code is set in the map block under the field TL1_Class. To select a valid TL1_Class use the following table.

Notification Code	Description
CR	Critical Alarm
MJ	Major Alarm
MN	Minor Alarm
NA	Not Alarmed
NR	Not Reported

For alarms set with a notification code of Not Alarmed (NA), the TL1 driver will generate a report event command rather than a report alarm. Both "Not Alarmed" and "Not Reported" alarms can be polled by the TL1 Client using the Retrieve Alarm command (RTRV-ALM-ENV). For Map Descriptors that are used for control, the Class can be set to NR to avoid alarms being generated while the point is being controlled.

To allow the FieldServer to simulate multiple devices, the TID field used in TL1 messages has been mapped to Node Id's within the FieldServer.

Within each device (TID) multiple unique alarms of the same type can be reported by using the Access Identification (AID) field. The AID (1-255) maps into the address field in the Map Descriptor. If the FieldServer is being used for control, then some AIDs will be used to set up Map Descriptors for the data to be transferred.

Example

Nodes				
Node_Name,,		Node_ID,		Protocol,
TID1,		1,		TL1
TID2,		2,		TL1
Map_Descriptors				
Map_Descriptor_Name,	Address,	Node Name	TL1_Class	TL1_Message
AIRCOMPR,	1,	TID1,	CR,	"Low Pressure"
AIRCOMPR,	1,	TID2,	CR,	"Low Pressure"
PUMP,	2,	TID1,	CR,	"Pump Dry"
RELAY,	200,	TID1,	NR,	"Relay Output"

The last parameters that must be set in each Map Descriptor point to a location in a Data Array that will be monitored or controlled by the TL1 driver. Adding a Data Array name and Data Array location to the Map Descriptor specifies this location. The Data Array should be either a bit type or an int16 type for alarms. For control values, the Data Array should be either a bit type, int16 type or float.

4.1.   Data Arrays/Descriptors

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.	INT16, 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_Format,              Data_Array_Length,
DA_AI_01,                  Float,                    200
DA_AO_01,                  Float,                    200
DA_DI_01,                  Bit,                      200
DA_DO_01,                  Bit,                      200
```

4.2.   Server Side Connection Descriptions

Section Title	
Connections	

Column Title	Function	Legal Values
Port	Specify which port the device is connected to the FieldServer	P1-P8, R1-R2[1]
Baud*	Specify baud rate	300-19200
Parity*	Specify parity	Any
Data_Bits*	Specify data bits	7, **8**

Example1: Standalone TL1 Connection

```
Connections
Port,       Baud,         Parity,         Data_Bits,   Protocol,          IC_Timeout
P1,         19200,        Even,           7,           TL1,               20s
```

Example2: TL1 Used Over Telnet

```
Connections
Port,       Baud,         IC_Timeout
VC1,        9600,         20s
VS1,        9600,         20s


Connections
Adapter,    Protocol,     Password,       Username,    Autoconnect_port,  Session_timeout
N1,         Telnet,       -,              -,           VS1,               300s
```

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[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.

4.3.   Server Side Node Descriptors

Section Title
Nodes

Column Title	Function	Legal Values
Node_Name	Provide name for TID	Up to 32 alphanumeric characters
Node_ID	TID Number	1-255
Protocol	Specify protocol used	TL1

Example1: Standalone TL1 Nodes

```
//   Server Side Nodes

Nodes
Node_Name,          Node_ID,          Protocol,          Connection
TL1_01,             11,               TL1,               P1
```

Example2: TL1 Used Over Telnet

```
//   Server Side Nodes

Nodes
Node_Name,          Node_ID,          Protocol,          Connection
TL1_01,             11,               TL1,               VC1
```

4.4.   Server Side Map Descriptors

4.4.1.   FieldServer Specific Map Descriptor Parameters

Column Title	Function	Legal Values
Map_Descriptor_Name	Name of this Map Descriptor Used as the Alarm Type	Up to 20 alphanumeric characters
Data_Array_Name	Name of Data Array that will indicate an alarm.	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

4.4.2. Driver Related Map Descriptor Parameters

Column Title	Function	Legal Values
Node_Name	TID Identification to use for this alarm	One of the node names specified in "Node Descriptor" above
TL1_Class	Starting Notification Code panel	CR, MJ, MN, NA, NR
TL1_Message	Starting Alarm Message	Up to 40 alphanumeric characters
Length	Length of Map Descriptor	1

4.4.3. Map Descriptor Example.

Node Name,	Map_Descriptor_Name,	TL1_Class,	TL1_Message,	Data_Array_Name,	Data_Array_Offset	Function,	Address,	Length
TL1_01,	AC1FANSTATUS,	NR,	"A/C 1 Cool",	DA_DI_01,	1,	Passive,	1,	1
TL1_01,	AC1COOLSTATUS,	NR,	"A/C 1 Heat",	DA_DI_01,	2,	Passive,	2,	1
TL1_01,	AC1HEATSTATUS,	NR,	"A/C 2 Fan",	DA_DI_01,	3,	Passive,	3,	1
TL1_01,	AC2FANSTATUS,	NR,	"A/C 2 Cool",	DA_DI_01,	4,	Passive,	4,	1
TL1_01,	AC2COOLSTATUS,	NR,	"A/C 2 Heat",	DA_DI_01,	5,	Passive,	5,	1
TL1_01,	AC2HEATSTATUS,	NR,	"A/C 1 Cool",	DA_DI_01,	6,	Passive,	6,	1

Appendix A. TL1 Commands Supported

The following is a brief description of the TL1 commands supported by the FieldServer. For further information, please refer to the TL1 specification.

Appendix A.1. Message Allow Commands

This group allows messages to be automatically generated for alarms that match:
<tid> Maps to node in the FieldServer (1-255)
<aid> Maps to point in the FieldServer (1-255)
<condtype> Maps to Map Descriptor name.

ALW-MSG-ALL:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>],[<condtype>][,<tmper>];
ALW-MSG-COM:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>],[<condtype>][,<tmper>];
ALW-MSG-ENV:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>],[<condtype>][,<tmper>];
ALW-MSG-EQPT:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>],[<condtype>][,<tmper>];

Appendix A.2. Message Inhibit Commands

This group inhibits messages from being automatically generated for alarms that match:
<tid> Maps to node in the FieldServer (1-255)
<aid> Maps to point in the FieldServer (1-255)
<condtype> Maps to Map Descriptor name.

INH-MSG-ALL:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>],[<condtype>][,<tmper>];
INH-MSG-COM:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>],[<condtype>][,<tmper>];
INH-MSG-ENV:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>],[<condtype>][,<tmper>];
INH-MSG-EQPT:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>],[<condtype>][,<tmper>];

Appendix A.3. Alarm State Retrieval

This group retrieves the current alarm states.
RTRV-ALM-ENV:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>][,<almtype>];
RTRV-ATTR-ENV:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>][,<almtype>];

Appendix A.4. Alarm Message Control

This command sets the message to be reported, as well as notification code.
SET-ATTR-ENV:[<tid>]:[<aid>]:<ctag>::[<ntfcncde>],[<almtype>][,<almmsg>];

Appendix A.5. Session Control

To allow a remote site to access the FieldServer, an ACT-USER command must first be sent. When complete the CANC-USER should be transmitted.
ACT-USER:[<tid>]:<userid>:<ctag>::"password";
CANC-USER:[<tid>]:<ctag>;

Appendix A.6. Discrete Control

These commands will set (OPR) clear (RLS) or read (RTRV) an ouput bit.
Note: momentary is not supported.
OPR-EXT-CONT:[<tid>]:<aid>:<ctag>::[<conttype>][,<dur>];
RLS-EXT-CONT:[<tid>]:<aid>:<ctag>::[<conttype>][,<dur>];
RTRV-EXT-CONT:[<tid>]:<aid>:<ctag>[::<conttype>];

Appendix A.7.   Analog Control

These commands will read (RTRV) or write (SET) analog control values.
Note: values are floats.
RTRV-EXT-ANLG:[<tid>]:<aid>:<ctag>[::<conttype>];

SET-EXT-ANLG:[<tid>]:<aid>:<ctag>::<value>;

Appendix A.8.   Change of State

REPT-ALM-ENV is used as an unsolicited change-of-state reporting message. It is complemented by REPT-EVT-ENV, which is used to report a change-of-state in a non-alarm point.

Appendix B. Troubleshooting tips

Appendix B.1.   Access 'Deny'

If a user is logged in with a specific <tid> (Node_Id 1-255) using command *ACT-USER:tid:userid:ctag::"password";* then the user will have access to data for this particular <tid> only, and all requests to access data from other <tid> will be denied.
There are two ways to overcome this issue
• With Integrated Security - Re-login with new <tid> before requesting data for new <tid>.
• Bypass Security - Log-in once with blank <tid> as follows: *ACT-USER::userid:ctag::"password";*

Appendix B.2. Testing the TL1 driver using site logs

- Obtain ASCII log from site unless TL1 is used over telnet, in which case obtain ethereal log.
- Create a text file with extension .gm. Populate this file with all commands sent by TL1 Client to FieldServer.
- Create another csv to feed this log to the Driver running with the customer configuration. (See script s4872a.f for more detail).
- A Map Descriptor similar to the following example should be created.
- Ensure first message is of 'ACT-USER' type to log-in.

Map_Descriptors,						
Map_Descriptor_Name,	Data_Array_Name,	Data_Array_Offset,	Function,	Node Name,	Length,	Scan_Interval,
s4872a.gm,	DA_AI_01,	1,	RDB,	TL1_01,	1,	1.000s
s4872a.gm,	DA_AI_01,	2,	RDB,	TL1_01,	1,	1.000s
s4872a.gm,	DA_AI_01,	3,	RDB,	TL1_01,	1,	1.000s
s4872a.gm,	DA_AI_01,	4,	RDB,	TL1_01,	1,	1.000s
s4872a.gm,	DA_AI_01,	5,	RDB,	TL1_01,	1,	1.000s

Text file with commands sent by TL1 Client to FieldServer.

Line number to be used by the Map Descriptor

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