

ER750

Programming Guide

DLL Functions
Protocol Command Set

REV.A

December 24, 2015

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1. Introduction

1.1 Overview

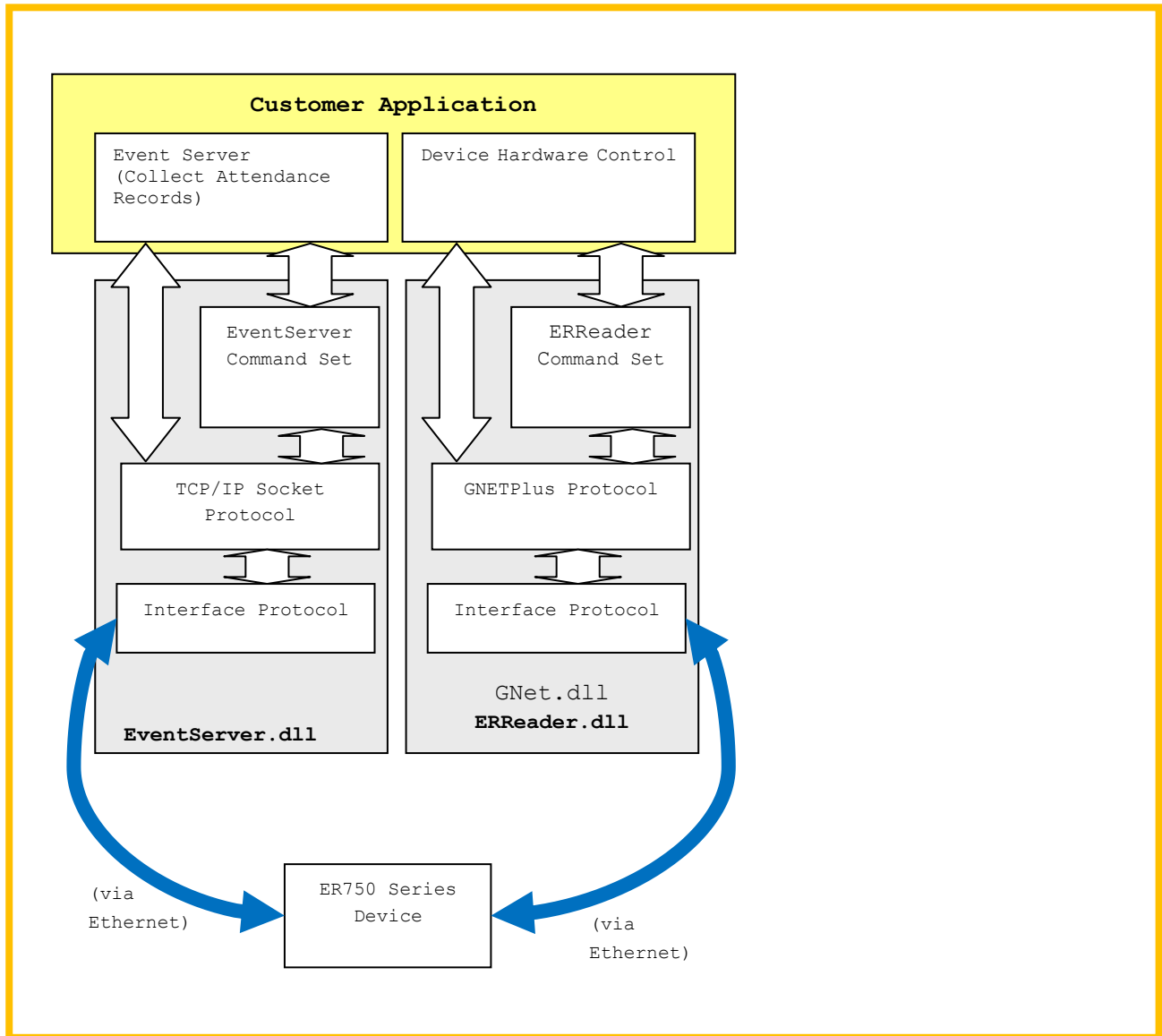
With ER750 DLL functions, it is not necessary to write any program for communication protocol to perform the operations of ER750 series device.

ER750 DLL Files include:

Source Code Project Name	Programming Language	References DLL File Name	Summary
Ethernet Reader Discover	VB 6	GNetPlusNetX.ocx	
Ethernet Reader Event Server	VB.Net / VB2008	EventServer.dll	Event Server (Collect Attendance Records)
		ERReader.dll	Device Hardware Control
		GNet.dll	
	VB6	GNetPlusNetX.ocx	Event Server (Collect Attendance Records) and Device Hardware Control

Note: VB Source Codes are in CD.

1.2 Customer Application Scheme



Note: EventServer Command Set = EventServer.dll
ERReader Command Set = ERReader.dll

2. Functions

2.1 Introduce GNetPlus Protocol

You can also write your functions by inherit the GNet/GNetPlus protocols, and have not using ER750 dlls.

To study more detail about GNet/GNetPlus protocols, please read:

TM970013_GNetPlusCommunicationProtocol.pdf

2.1.1 GNetPlus Protocol Command Set Table

Common Query Function Code Table (00h~1Fh)

Desc	Query (Master)			Response (Slave)		
	Func	Len	Data Bytes	Func	Len	Data Bytes
Polling	00h	0		ACK	n	Return OEM Status
Get Version	01h	0		ACK	n	Return OEM Version String
Set Slave Addr	02h	1	New Address (1~255)	ACK	0	
		5	Addr (byte) + SN (long)	ACK	1	Return New Addr
Logon	03h	n	OEM Password	ACK	0	
Logoff	04h	0		ACK	0	
Set Password	05h	n	OEM New Password	ACK	0	
Class Name	06h	0		ACK	n	Return Class Name
Set Date/Time	07h	7	GNET_DATETIME Structure ¹	ACK	0	
Get Date/Time	08h	0		ACK	7	GNET_DATETIME Structure
Get Register	09h	3	Reg.Address ² + Reg.Len ³	ACK	n	Reg.Block
Set Register	0Ah	n	Reg.Address + Reg.Buffer	ACK	0	
Record Count	0Bh	0		ACK	2	Record Count (Integer)
Get First Record	0Ch	0		ACK	n	First Record
Get Next Record	0Dh	0		ACK	n	Next Record
Erase All Records	0Eh	0		ACK	0	
Add Record	0Fh	n	Record	ACK	0	
Recover All Records	10h	0		ACK	0	
DO	11h	2	DO# + STATUS(0 or 1)	ACK	0	
DI	12h	1	DI#	ACK	1	DI STATUS
Analog Input	13h	1	Channel#	ACK	2	Value (Integer)
Thermometer	14h	0		ACK	2	Value (Integer)
Get Node	15h	0		ACK	n	Get Record with Remove
Get S/N	16h	0		ACK	4	SN
Silent Mode	17h	1	ON(1)/OFF(0)	ACK	1	ON(1) / OFF(0)
		2	ON(1)/OFF(0)+except Addr.	ACK	1	ON(1) / OFF(0)
Reserve	18h					
Enable Auto Mode	19h	1	Boolean	ACK	1	Result
Get Time Adjust ^{OEM}	1Ah	0		ACK	4	Time Adjust Value (long)
Echo	1Bh	N	Any Data	ACK	n	Master Data
Set Time Adjust ^{OEM}	1Ch	4	Time Adjust Value (long)	ACK	0	

Debug	1Dh	0		ACK	n	OEM Debug Message
Reset	1Eh	0		ACK	0	
Go To ISP	1Fh	0		ACK	0	

Response NAK Code Table (Common)

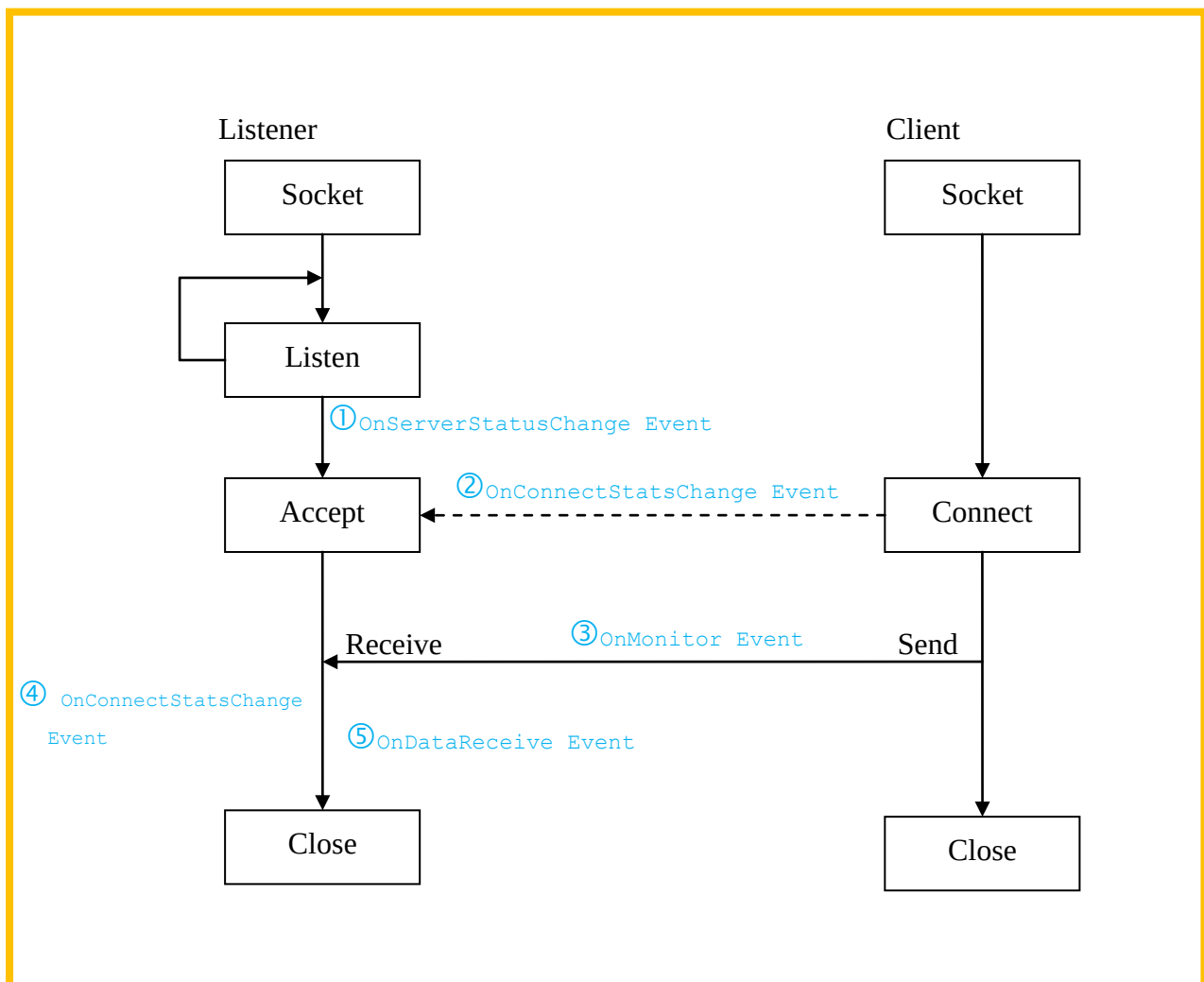
Func	Len	Data Bytes	Description
NAK	1	E0h	Access Denied
NAK	1	E4h	Illegal Query Code
NAK	1	E6h	Overrun, Out of record count
NAK	1	E7h	CRC Error (GNetPlus CRC16)
NAK	1	ECh	Query Number no support
NAK	1	EDh	Out Of Memory Range
NAK	1	EEh	Address Number out of range
NAK	1	EFh	Unknown

Response Event (For Active Slave)

	Active Response (Slave)		
Desc	Func	Len	Data Bytes
Event	12h	n	Customer Event Code or Data

2.2 Introduce EventServer.dll

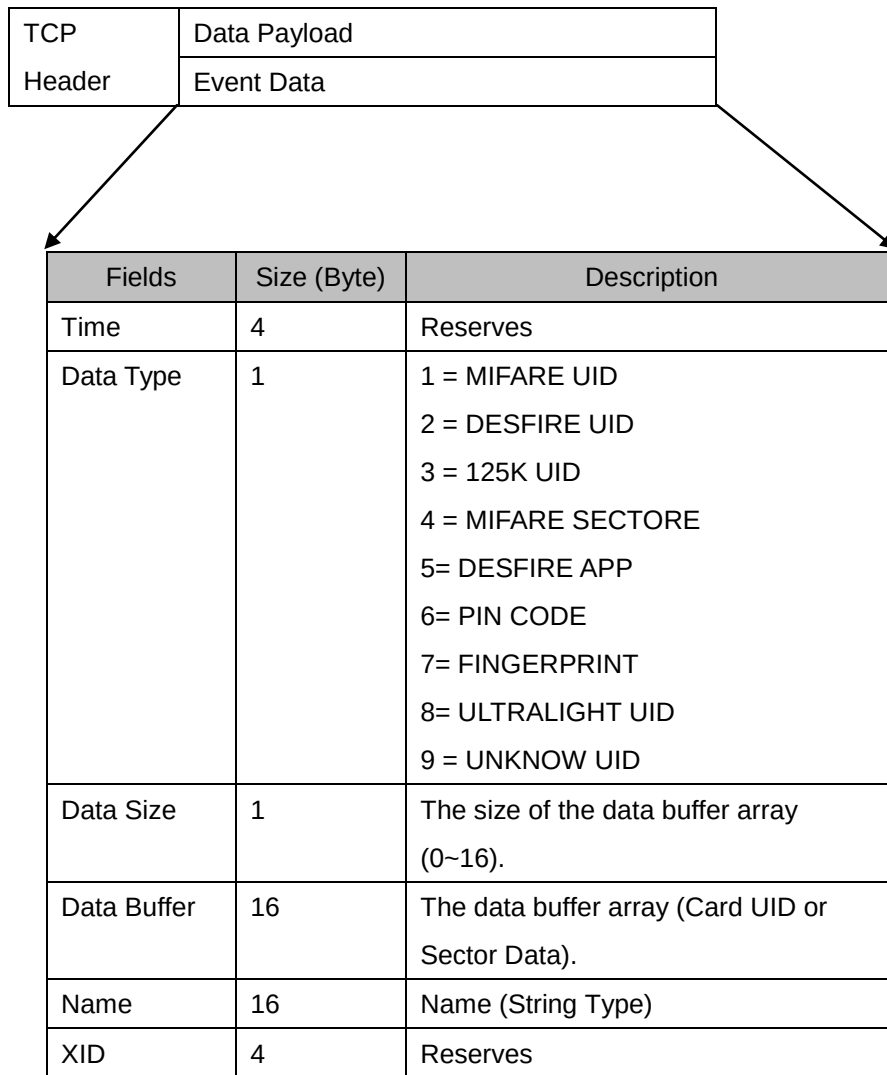
2.2.1 EventServer Socket Scheme by Using EventServer.dll



2.2.2 Event Data Structure

TCP Port Number: 2168 (Default)

TCP Data Payload (Event Packet) :



Total: 42 bytes

2.2.3 The Properties, Methods & Events of EventServer.dll

Class Name	Statement	Member
ClientEvent	Properties	DateTime
		DataType
		DataSize
		DataBuffer
		Name
		Data
	Methods	ToClientEventList
		ToClientEventList.ToString
	Events	
MyTCPClient	Properties	ConnectTo
	Methods	getClientMacAddress
	Events	
MyTCPListener	Properties	MaxConnectionCount
		IsServerStarted
	Methods	Close
		Listen
	Events	OnConnectStatusChanged
		OnDataReceive
		OnError
		OnMonitor
		OnServerStatusChanged
TimeZoneInfo	Properties	CurrentTimeZone.StandardUtcOffset
		CurrentTimeZone.StandardUtcOffsetNumeral
	Methods	
	Events	

2.2.3.a ClientEvent Properties, Methods and Events

Property	DateTime (Read Only)
Description	Return the Time field of event data structure.
Syntax	<i>Date = ClientEventList(ListIndex).DateTime</i>
Parameter	
Note	

Property	DateType (Read Only)
Description	Return the DataType field of event data structure.
Syntax	<i>Byte = ClientEventList(ListIndex).DateType</i>
Parameter	
Note	

Property	DateSize (Read Only)
Description	Return the DataSize field of event data structure.
Syntax	<i>Integer = ClientEventList(ListIndex).DateSize</i>
Parameter	
Note	

Property	DateBuffer (Read Only)
Description	Return the DataBuffer field of event data structure.
Syntax	<i>Byte = ClientEventList(ListIndex).DateBuffer</i>
Parameter	
Note	

Property	Name (Read Only)
Description	Return the Name field of event data structure.
Syntax	<i>String = ClientEventList(ListIndex).Name</i>
Parameter	
Note	Except ER750 series.

Property	Data (Read Only)
Description	Return the DataBuffer field of event data structure in string type.
Syntax	<i>String = ClientEventList(ListIndex).Data</i>
Parameter	
Note	Except ER750 series.

Method	ToClientEventList
Description	Get Event Data as List (of Object.ClientEvents) type.
Syntax	<i>List (of ClientEvents) = List.ToClientEventList(bIsEnablePCTime, _ bIsUID_MSB_first,bytBuffer(), iLength, iTimeZoneOffset)</i>
Parameter	<i>bIsEnablePCTime: Boolean, True - Local PC time; False - Standard UTC time</i> <i>bIsUID_MSB_first: Boolean, True – Data Buffer (Card UID) in MSB first order;</i> <i>False - Data Buffer (Card UID) in LSB first order</i> <i>bytBuffer(): Byte, the package of event</i> <i>iLength: Integer, the package length</i> <i>iTimeZoneOffset: Integer, the local PC's time zone offset</i>
Note	

Method	ToClientEventList.ToString
Description	Get Event Data as string type.
Syntax	<i>String = List.Item(ListIndex).ToString()</i>
Parameter	
Note	Output string: [yyyy/MM/dd hh:mm:ss] [DataType] [Data Buffer (Card UID)] [Name]

2.2.3.b MyTCPClient Properties, Methods and Events

Property	ConnectTo (Read Only)
Description	Return the IP address of client device.
Syntax	<i>String = Object.ConnectTo</i>
Parameter	

Method	getClientMacAddress
Description	Get device MAC address.
Syntax	<i>String = Object.getClientMacAddress(IPAddress)</i>
Parameter	<i>IPAddress: String, device IP address</i>
Note	Output string: [yyyy/MM/dd hh:mm:ss] [DataType] [Data Buffer (Card UID)] [Name]

2.2.3.c MyTCPListener Properties, Methods and Events

Property	MaxConnectionCount
Description	Set or return the max connection count of server (listener).
Syntax	<i>String = Object.ConnectTo</i>
Parameter	

Property	IsServerStarted (Read Only)
Description	Check if server is already in the socket flow.
Syntax	<i>Boolean = Object.IsServerStarted</i>
Parameter	

Method	Close
Description	Close the server socket.
Syntax	<i>Object.Close</i>
Parameter	
Note	

Method	Listen
Description	The server starts to listen.
Syntax	<i>Boolean = Object.Listen(iPort)</i>
Parameter	<i>iPort: Integer, the serve's port number.</i>
Note	

Event	OnConnectStatusChanged
Description	Action when the connection status changed within server (listener) and client.
Syntax	<i>sender: Object, the TCP client.</i> <i>iStatus: Object.MyTCPClient.ConnectStatusConstants, 0 – Closed;</i> <i>1 – Connecting;</i> <i>2 – Connected.</i> <i>szConnectTo: String, the client side IP address.</i>

Event	OnDataReceive
Description	Action when the server (listener) received the data from client.
Syntax	<i>sender: Object, the TCP client.</i> <i>iBytesToReceive: Integer, the length of the received data package.</i> <i>bytDataBuffer: Byte, received data package.</i>

Event	OnError
Description	Action when server or client occur error.
Syntax	<i>source: String, the error source.</i> <i>e: Exception.</i>

Event	OnServerStatusChanged
Description	Action when the server (listener) status changed.
Syntax	<i>sender: Object, the TCP server.</i> <i>blsServerStarted: Boolean, the server is started or not.</i>

2.2.3.d TimeZoneInfo Properties, Methods and Events

Property	CurrentTimeZone.StandardUtcOffset (Read Only)
Description	Return the standard UTC offset as TimeSpan type of local PC.
Syntax	<i>String = TimeSpan.ToString</i>
Parameter	

Property	CurrentTimeZone.StandardUtcOffsetNumeral (Read Only)
Description	Return the standard UTC offset as Byte type of local PC.
Syntax	<i>Byte = CurrentTimeZone.StandardUtcOffsetNumeral(index)</i>
Parameter	<i>Index=0: the hour of Time offset</i> <i>Index=1: the minute of Time Offset</i>

2.3 Introduce ERReader.dll

2.3.1 The Properties, Methods & Events of ERReader.dll

Class Name	Statement	Member
ERReader	Properties	PortOpen
		EnumCommPortEx
	Methods	AutoScan
		ConnectToReader
		setRelay
		setLedBuzzer
		getCardStatus
	Events	

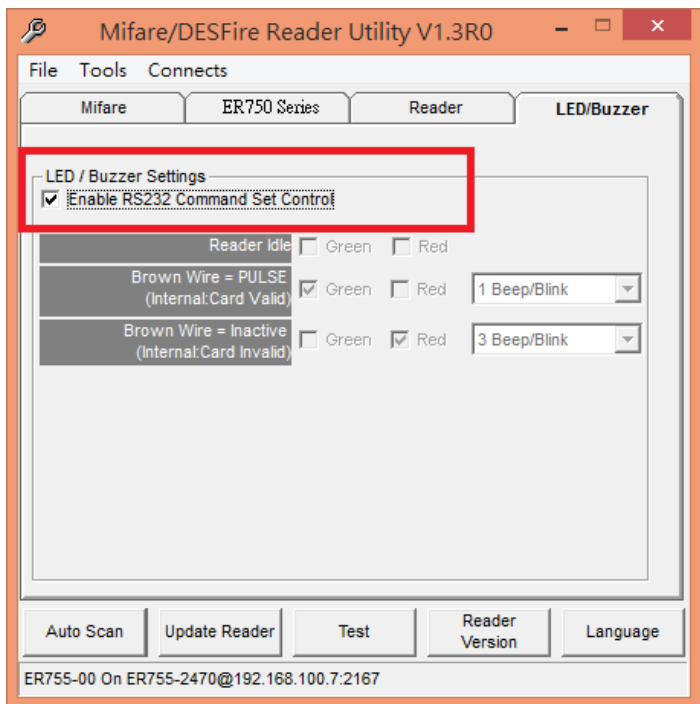
2.3.1.a ERReader Properties, Methods and Events

Property	PortOpen
Description	Set or return the connection of device com port.
Syntax	<i>Boolean = Object.PortOpen</i>
Parameter	

Property	EnumCommPortEx
Description	Return available com ports.
Syntax	<i>String = Object.EnumCommPortEx</i>
Parameter	

Property	AutoScan
Description	Scan and connect to com ports.
Syntax	<i>Boolean=Object.AutoScan (iMType,iReadModal,szSetPort,bOnlySetPort)</i>
Parameter	<i>iMType: Integer, machine type constant (default: Any=-1)</i> <i>iReadModal: Integer, reader model constant (default: Any=-1)</i> <i>szSetPort: String, the assignment com port (the prior scan com port)</i> <i>bOnlySetPort: Boolean, True – only scan assignment com port;</i> <i>False –auto scan all available com ports</i>
Note	

Property	ConnectToReader
Description	Connect to the specified com port.
Syntax	<i>Boolean=Object.ConnectToReader(szSetPort)</i>
Parameter	<i>szSetPort: String, the assignment com port</i>
Note	Supported from V1.1.0.1

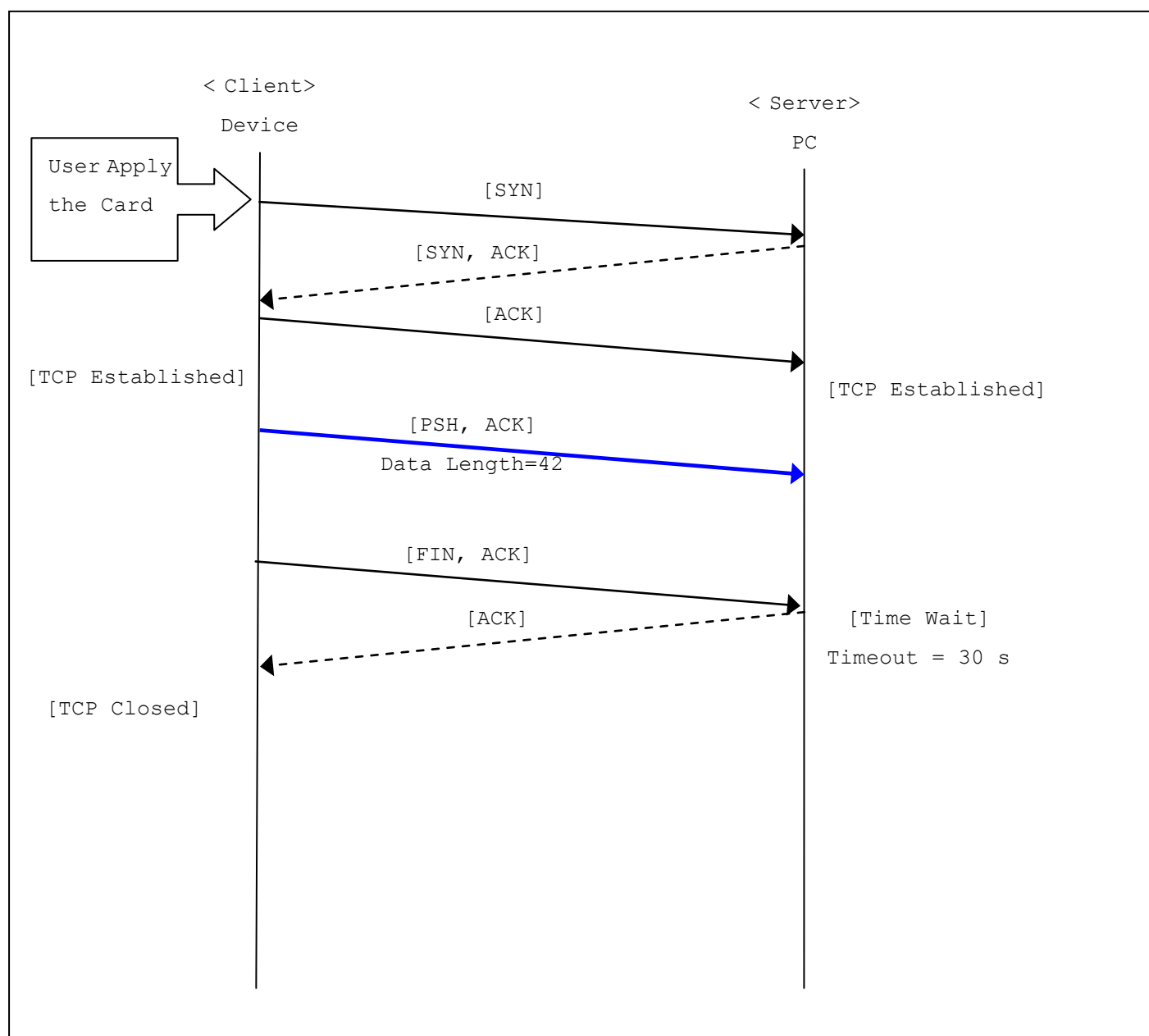
Method	setLedBuzzer																										
Description	Control LED/Buzzer (hardware I/O).																										
Syntax	In VB.net: <pre>Boolean = Object.setLedBuzzer(sCommandNumber)</pre> In VB 6: <pre>Object.Output = STX & "J" & sCommandNumber & CR</pre>																										
Parameter	sCommandNumber: String, Command Table as below: <table><thead><tr><th>NUMBER</th><th>Descriptions</th></tr></thead><tbody><tr><td>0 (30h)</td><td>Red & Green LED Off, Buzzer Off</td></tr><tr><td>1 (31h)</td><td>Green LED ON</td></tr><tr><td>2 (32h)</td><td>Green LED OFF</td></tr><tr><td>3 (33h)</td><td>Red LED ON</td></tr><tr><td>4 (34h)</td><td>Red LED OFF</td></tr><tr><td>5 (35h)</td><td>Buzzer Beep once</td></tr><tr><td>6 (36h)</td><td>Buzzer Beep 3 Times</td></tr><tr><td>7 (37h)</td><td>Green LED ON with Beep once</td></tr><tr><td>8 (38h)</td><td>Red LED ON with Beep 3 Times</td></tr><tr><td>9 (39h)</td><td>Red & Green LED ON</td></tr><tr><td>A (41h)</td><td>Blue LED ON</td></tr><tr><td>B (42h)</td><td>Blue LED OFF</td></tr></tbody></table>	NUMBER	Descriptions	0 (30h)	Red & Green LED Off, Buzzer Off	1 (31h)	Green LED ON	2 (32h)	Green LED OFF	3 (33h)	Red LED ON	4 (34h)	Red LED OFF	5 (35h)	Buzzer Beep once	6 (36h)	Buzzer Beep 3 Times	7 (37h)	Green LED ON with Beep once	8 (38h)	Red LED ON with Beep 3 Times	9 (39h)	Red & Green LED ON	A (41h)	Blue LED ON	B (42h)	Blue LED OFF
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B (42h)	Blue LED OFF																										
Note	* LED/Buzzer control command set frame as below: <table><thead><tr><th>STX</th><th>J</th><th>NUMBER (0~B)</th><th>CR</th></tr></thead><tbody><tr><td>02h</td><td>4Ah</td><td>30h~39h, 41h,42h</td><td>0Dh</td></tr></tbody></table> * To use this method, first you have to enable the hardware command set control function in the utility. 	STX	J	NUMBER (0~B)	CR	02h	4Ah	30h~39h, 41h,42h	0Dh																		
STX	J	NUMBER (0~B)	CR																								
02h	4Ah	30h~39h, 41h,42h	0Dh																								

Method	setRelay																
Description	Set seconds or disable for the delay open period time. (Hardware Control)																
Syntax	In VB.net: Boolean=Object.setRelay (iPeriodTime) In VB.net (only for ER750-10): Boolean=Object.setRelay (iFunction) In VB 6: Boolean=Object.Query(&H11, bytPeriodTime)																
Parameter	bytPeriodTime: Byte, the period time to close the relay (available in 0~255 seconds) for ER750-10: iFunction = 1, set the relay always On. iFunction = 2, set the relay Off.																
Note	* Command set frame as below (ex: 255s): <table><tr><th>SOH</th><th>Address</th><th>Function</th><th>Data Length</th><th>(MSB) Data Bytes</th><th>(LSB)</th><th colspan="2">Check (CRC-16)</th></tr><tr><td>01h</td><td>00h</td><td>11h</td><td>02h</td><td>00h</td><td>FFh</td><td>BCh</td><td>C0h</td></tr></table> ** The Check means the CRC (CRC-16 Modbus), and calculates from Address to Data Bytes. * To use this method, first you have to enable the hardware command set control function in the utility.	SOH	Address	Function	Data Length	(MSB) Data Bytes	(LSB)	Check (CRC-16)		01h	00h	11h	02h	00h	FFh	BCh	C0h
SOH	Address	Function	Data Length	(MSB) Data Bytes	(LSB)	Check (CRC-16)											
01h	00h	11h	02h	00h	FFh	BCh	C0h										

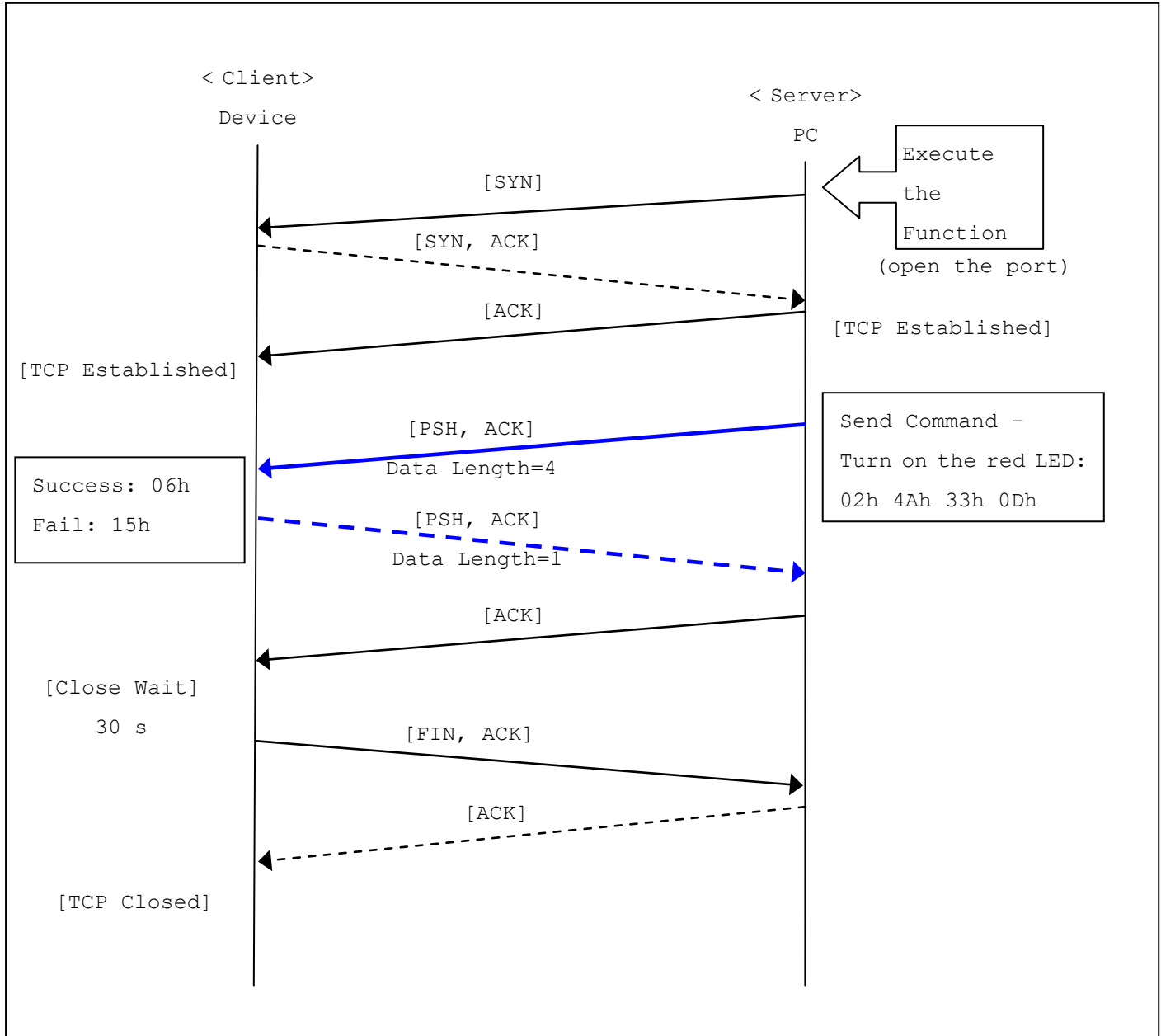
Method	getCardStatus						
Description	Get the status of card is inserted or removed.						
Syntax	<i>In VB.net (only for ER750-10):</i> <i>bResult=Object.getCardStatus (ByRef iResponse as Integer)</i>						
Parameter	<i>bResult: Boolean, ACK after send the command set.</i> <i>iResponse = 0, Card Insert.</i> <i>iResponse = 1, Card Remove.</i>						
Note	* command set frame as below: <table><tr><td>STX</td><td>.</td><td>CR</td></tr><tr><td>02h</td><td>E2h</td><td>0Dh</td></tr></table> * To use this method, first you have to enable the hardware command set control function in the utility. * Supported from V1.1.0.0	STX	.	CR	02h	E2h	0Dh
STX	.	CR					
02h	E2h	0Dh					

2.4 Common Communication Flow Chart

2.4.1 Send Read Card from the Device to the PC



2.4.2 Turn on the Red LED of the Device from the PC



Note: The send command please reference the setLedBuzzer, setRelay method for detail.

Appendix

ANNEX A. History

November 06, 2015 (REV.A)
Initial ER750 Programming Guide.
November 12, 2015 (REV.A)
Add the command set frame at the setRelay function. (p.19)
December 24, 2015 (REV.A)
Add a new command :ConnectToReader() of ERReader.dll.