

Dynatrol DS-32 RTU

DNP3 Protocol Remote Interface Application Configuration Manual

Version: 3.0



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Table of Contents

1	OVERVIEW.....	1-1
2	REMOTE INTERFACE APPLICATION TABLE (R06_RIA).....	2-1
3	ASYNCHRONOUS COMMUNICATIONS TABLE (R06_COMM).....	3-1
4	REMOTE DEVICE TABLE (R06_REM).....	4-1
5	DATA POLL TABLE (R06_POLL).....	5-1

List of Tables

TABLE 2-1: REMOTE INTERFACE APPLICATION TABLE (R06_RIA).....	2-1
TABLE 3-1: ASYNCHRONOUS COMMUNICATION TABLE (R06_COMM).....	3-1
TABLE 4-1: REMOTE DEVICE TABLE (R06_REM).....	4-1
TABLE 5-1: DATA POLL TABLE (R06_POLL).....	5-1

List of Figures

FIGURE 1-1: R06 APPLICATION CONFIGURABLE TABLES RELATIONSHIP.....	1-2
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1 Overview

The DNP3 Remote Interface Application (RIA) is the Dynatrol DS-32 RTU application (R06) designed to interface with the IED that communicate with DNP3 protocol. This is a configuration manual that allows the user to successfully configure the application. There are 4 configurable tables in this application.

1. Remote Interface Application Table (R06_RIA).
2. Asynchronous Communications Table (R06_COMM).
3. Remote Device Table (R06_REM)
4. Data Poll Table (R06_POLL)

Figure 1-1 shows an example of how the tables can be configured. It also shows the relationship among these tables.

NOTE: *This version of DNP3 RIA does not support unsolicited messages.*

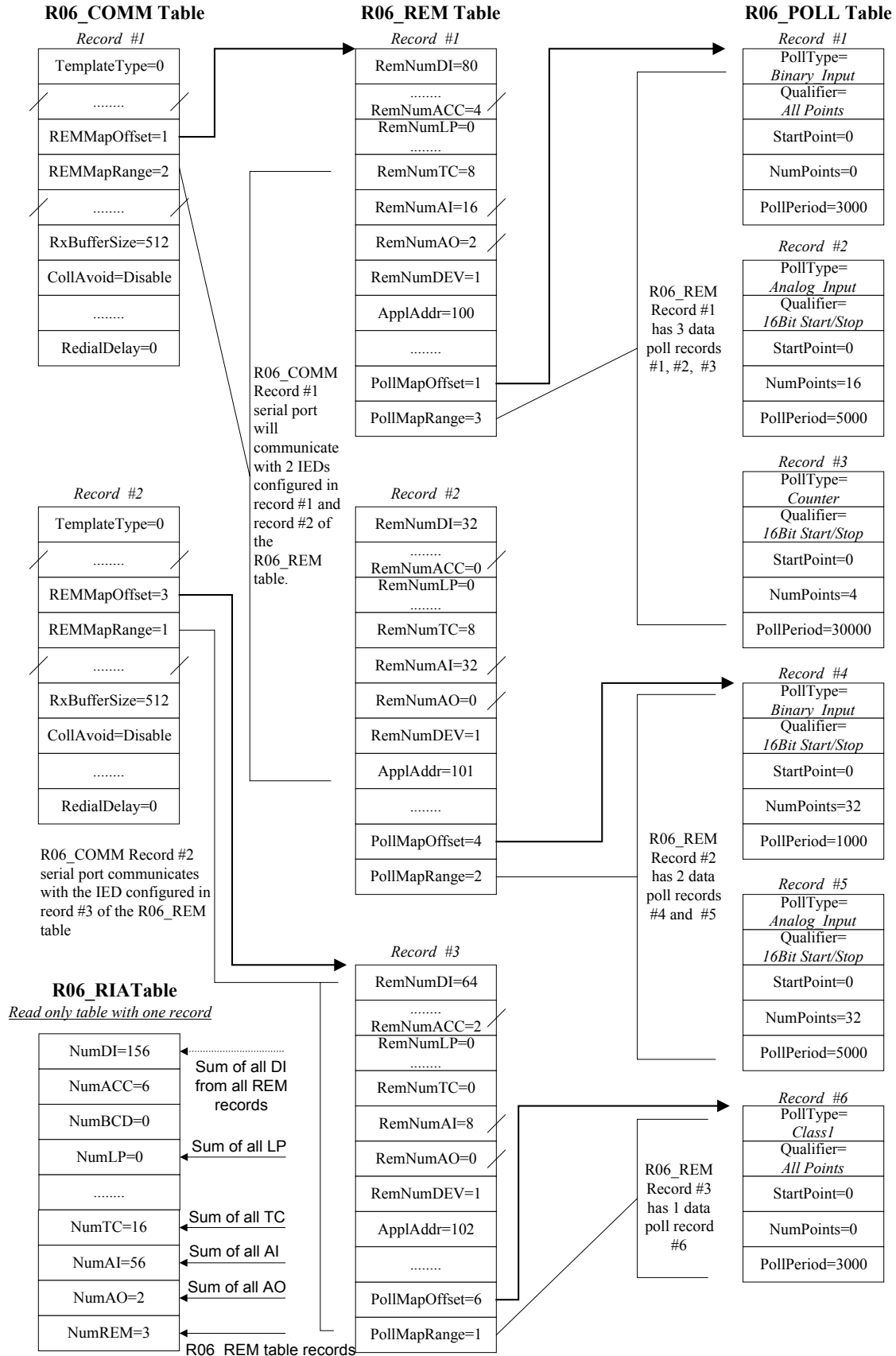


Figure 1-1: R06 Application configurable tables Relationship

2 Remote Interface Application Table (R06_RIA)

The Remote Interface Application Table (R06_RIA) is a read only table showing the total input/output points owned by the DNP3 IED RIA application.

Table 2-1: Remote Interface Application Table (R06_RIA)

Field Name	Description	Note
NumDI	The total number of Digital Input points owned by this RIA. This number should be equal to the total number of binary status of all DNP3 IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumDI</i> in all R06_REM Table records.
NumACC	The total number of Accumulator Input points owned by this RIA. This number should be equal to the total number of accumulator inputs of all DNP3 IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumACC</i> in all R06_REM Table records.
NumBCD	The total number of Binary Coded Decimal points owned by this RIA. This field is always set to zero.	This is a read only field.
NumLP	The total number of Latch/Pulse Output points owned by this RIA. This field is always set to zero.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumLP</i> in all R06_REM Table records.
NumRL	The total number of Raise/Lower Output points owned by this RIA. This field is always set to zero.	This is a read only field.
NumPAT	The total number of Pattern Output points owned by this RIA. This field is always set to zero.	This is a read only field.
NumDPS	The total number of Double Point Select Output points owned by this RIA. This field is always set to zero.	This is a read only field.
NumTC	The total number of Trip/Close Output points owned by this RIA. This number should be equal to the total number of trip/close outputs of all DNP3 IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumTC</i> in all R06_REM Table records.
NumAI	The total number of Analog Input points owned by this RIA. This number should be equal to the total number of actual values or setpoints of all DNP3 IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumAI</i> in all R06_REM table records.
NumAO	The total number of Analog Output points owned by this RIA. This number should be equal to the total number of store single setpoints of all DNP3 IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumAO</i> in all R06_REM table records.
NumDEV	The total number of Devices owned by this RIA. This number should be equal to the total number of DNP3 IED devices configured.	This is a read only field. The DynaConfig automatically updates this number.

3 Asynchronous Communications Table (R06 COMM)

The Asynchronous Communication Table (R06_COMM) is a configurable table allowing the user to configure the serial communications parameters of up to five (5) communications ports in the DS-32 RTU Main board. All 5 communications ports may be configured to interface with the DNP3 master.

For redundant channel configuration, the user must configure one communication port for 'Primary' Channel and the second communication port for 'Backup' Channel. Both Communication ports must be using the same Remote (R06_REM) record for the same polling list.

Table 3-1: Asynchronous Communication Table (R06_COMM)

Field Name	Description	Field Type	Min Value	Max. Value	Typical Value	Note
TemplateType	Communications Template Type. Set to Asynchronous.	Integer	0	2	0	Read only. Set to zero
CommTimeout	Communications time out period in milliseconds.	Long	2000	4.29e9	60000	User Enter
CommFailCtrl	Communications timeout control type.	Long Pointer	Spare	Spare	Spare	Read only Not used.
AckNackDelay	Time to wait for control Ack/Nack before reply. If it times out before receiving the control Ack/Nack, the application assumes that the control Ack has received.	Integer	0	65535	0	Read only Not used.
RemMap Offset	Offset into R06_REM table.	Integer	0	65535	User Configure	Zero means disabled
RemMap Range	Number of R06_REM records associated with this port.	Integer	0	65535	User Configure	Zero means disabled.
TxBufferSize	Transmitting buffer size.	Integer	32	1024	512	Read only
DataLink Layer	Data link layer name. This field is not implemented in this application.	Appl. Name	Spare	Spare	Spare	Read only. Not used.
DataLinkTo DataLink	Data link to data link name. This field is not implemented in this application.	Char. List	Spare	Spare	Spare	Read only. Spare
Application Layer	Application name. This field is not implemented in this application.	Appl. Name	Spare	Spare	Spare	Read only. Spare

Field Name	Description	Field Type	Min Value	Max. Value	Typical Value	Note
BaudRate	Communications baud rate: 300, 600, 1200, 1800, 2400, 4800, 9600, 14400, 19200, 28800, and 38400.	Char. List	300	38400	9600	Select from pick list.
ConstDcd	DCD flag for constant or switching	Char. List	N/A	N/A	Switching	Set to be switching.
DcdWait	Time to wait (ms) before turn on the receiver (after DCD signal detected)	Integer	0	65535	0	Zero means disabled.
RtsOn	Time to wait (ms) before transmit message (after turn on RTS signal)	Integer	0	65535	0	Zero means disabled.
RtsOff	Time to wait (ms) before turn off RTS signal (after completed transmitting)	Integer	0	65535	0	Zero means disabled.
CtsTime	Time to wait (ms) for the CTS signal. If no CTS signal detected within this time, abort transmit.	Integer	0	65535	0	Zero means disabled.
DataBits	Number of communications data bits	Char.	7	9	8	Should be 8 data bits
StartBits	Number of communications start bits	Char.	1	2	1	Should be 1 start bit.
StopBits	Number of communications stop bits	Char.	1	2	1	Should be 1 stop bit.
Parity	Communication parity	Char. List	N/A	N/A	None	None, Even, or Odd.
Break	Break character to be appended.	Char. List	N/A	N/A	Normal	Read only. Not used.
FullHalfDup	Half Duplex/Full Duplex Flag. Half-Duplex is used in this application	Char. List	N/A	N/A	Half	Read only.
XonXoff	XON/XOFF character enabled/disabled flag	Char. List	N/A	N/A	Disable	Read only. Not used.
CharTimeOut	Character timeout (ms). This value changes according to baud rate (See table 2.2 for the cross-reference)	Integer	2	65535	9	Depends on baud rate

Field Name	Description	Field Type	Min Value	Max. Value	Typical Value	Note
DcdReport	DCD signal events to be sent to this application	Char. List	N/A	N/A	No reporting	Select from the pick list
CtsReport	CTS signal events to be sent to this application	Char. List	N/A	N/A	No reporting	Select from the pick list
RTUSize	Number of RTU addresses to be checked.	Integer	0	65535	1	Read only. Not used.
RxBufferSize	Receiving buffer size. It is set at 512 bytes	Integer	32	1024	512	Read only
ChannelType	Primary or Backup Channel on RTU startup	Char. List	N/A	N/A	Primary	Select from pick list
StayOnchannel	The channel to be used for polling; Primary or Active	Char. List	N/A	N/A	Active Channel	Future Implement. Read Only
NumTransChk	Number of successful transitions before check the standby channel. Zero means never check.	Integer	0	65535	0	Future implement. Read Only
CollAvoid	Enable or disable Collision avoidance for unsolicited messages	Char. List	Disable	Enable	Disable	For use of unsolicited message
RandDelay	Random delay (ms) to reduce the probability of 2 or more devices transmitting a frame at the same time	Char	0	255	0	This delay should be longer than the Master's
DCDdropTime	The maximum time (ms) to wait after DCD line drops	Integer	0	65535	0	Must be longer than Master's
Dialup	Enable or Disable dialup feature	Char. List	Disable	Enable	Disable	Pick list
RedialRetries	The number of attempts for redials	Char	0	255	2	Typical 2 retries
InitString	Dialup Modem initialization string	String	0 (length)	28 (length)	ATE0V0S0=3S7=18	See modem manual
ConnTimeout	Dialup Modem connection timeout (ms)	Integer	0	65536	30	Must be greater than remote's carrier
IdleTimeout	Maximum idle line time in seconds before terminate connection	Integer	0	65535	10	Small for master device
RedialDelay	Maximum redial delay time in minutes	Integer	0	65535	8	Multiple of 1 minute

4 Remote Device Table (R06 REM)

The Remote Device Table (R06_REM) is a configurable table allowing the user to configure DNP3 IEDs. The number of records configured should be equal to the number of IEDs interfaced with the DS-32 RTU.

Table 4-1: Remote Device Table (R06_REM)

Field Name	Description	Type	Min	Max	Typical	Note
RemNumDI	The total number of Digital Input points owned by this device. This number should be equal to the total number of binary inputs of the DNP3 IED.	Integer	0	65535	User select based on device	
RemNumACC	The total number of Accumulator Input points owned by this device.	Integer	0	65535	User select based on device	
RemNumBCD	The total number of Binary Coded Decimal points owned by this device. This field is always set to zero.	Integer	0	65535	0	Read only
RemNumLP	The total number of Latch/Pulse. The total number of binary outputs is the total number of Trip/Close and Latch/Pulse control points. The Trip/Close control points are first followed by the Latch/Pulse control points.	Integer	0	65535	User select based on device	
RemNumRL	The total number of Raise/Lower Output points owned by this device. This field is always set to zero.	Integer	0	0	0	Read only
RemNumPAT	The total number of Pattern Output points owned by this device. This field is always set to zero.	Integer	0	0	0	Read only
RemNumDPS	The total number of Double Point Select Output points owned by this device. This field is always set to zero.	Integer	0	0	0	Read only
RemNumTC	The total number of Trip/Close Output points owned by this device. The total number of binary outputs is the total number of Trip/Close and Latch/Pulse control points. The Trip/Close control points are first followed by the Latch/Pulse control points	Integer	0	65535	User select based on device	

Field Name	Description	Type	Min	Max	Typical	Note
RemNumAI	The total number of Analog Input points owned by this device. This number should be equal to the total number of analog points of the DNP3 IED configured	Integer	0	65535	User select based on device	
RemNumAO	The total number of Analog Output points owned by this device. This number should be equal to the total number of setpoints of the DNP3 IED configured	Integer	0	65535	User select based on device	
RemNumDEV	The number of device is one for each DNP3 IED	Integer	1	1	1	Read only
ApplAddr	The application address	Integer	0	65535	100	User enter
SlaveAddr	The slave (remote device) address that the RIA interfaces with	Integer	0	65535	1	User enter
DL_CFM	Data Link confirmation flag	Char. List	Send/Cfm	No-Cfm	Send / Cfm	Pick list
Retries	The number of datalink retries	Char.	0	255	2	User enter
CFM_Tout	Time (ms) waiting for the remote to send datalink confirm before retry	Long	0	4.29e9	600	User enter
InterFrmTime	Time (ms) to wait before sending the next segment of data for Send/No reply condition	Long	0	4.29e9	50	User enter
DialStr	The dial string	String	0	20	20	
PollMapOffset	The offset into the R06_POLL table	Integer	0	65535	User select	Zero means disabled
PollMapRange	Number of data polls (R06_POLL) associated with the remote device	Integer	0	65535	User select	Zero means disabled

5 Data Poll Table (R06 POLL)

The Data Poll Table (R06_POLL) is a configurable table allowing the user to configure the data polls for each associated remote device.

Table 5-1: Data Poll Table (R06_POLL)

Field Name	Description	Type	Min	Max	Typical	Note
PollType	Supported DNP3 objects are: - Binary_Input - Binary_Input_Event - Binary_Output - Counter - Frozen_Counter - Counter_Event - Frozen_Counter_Event - Analog_Input - Analog_Input_Event - Analog_Output - Class0 - Class1 - Class2 - Class3 - Class0123_Integrity - Class123_Integrity - Binary_Input_Integrity - Counter_Integrity - Frozen_Counter_Integrity - Analog_Input_Integrity	Char list	N/A	N/A	N/A	Select from pick list
Qualifier	Supported DNP3 Qualifier are - All Points (No Range) - 16Bit Start/Stop - 16Bit Quantity	Char list	N/A	N/A	N/A	Select from pick list
StartPoint	The point number for the associated data type selected when the user select the '16Bit Start/Stop' qualifier. When the qualiifier of 'All Points (No Range)' or '16Bit Quantity' is selected, this parameter is not used.	Integer	0	65535	N/A	Starting point number of a data type

Field Name	Description	Type	Min	Max	Typical	Note
NumPoints	The number of points for the associate data type. When the qualifier of 'All Points (No Range)' is selected, this parameter is not used. When the '16Bit Start/Stop' qualifier is selected, the stop point is equal to the NumPoints - 1.	Integer	0	65535	N/A	Number of points of a data type
PollPeriod	The periodic polling interval in milliseconds for the selected poll type	Long	0	4.29e9	3000	