

Dynatrol DS-32 RTU

CDC Type II Protocol Remote Interface Application Configuration Manual

Version: V11.0



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1 Overview

The CDC Type II Remote Interface Application (RIA) is the Dynatrol DS-32 RTU application (R05) designed to interface with the IED that communicate with CDC Type II protocol. This is a configuration manual that allows the user to successfully configure the application. There are five configurable tables in this application.

1. Remote Interface Application Table (R05_RIA).
2. Asynchronous Communications Table (R05_COMM).
3. Remote Device Table (R05_REM)
4. Scan 3x Table (R05_S3X)
5. Scan Sequence Table (R05_SEQ)

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

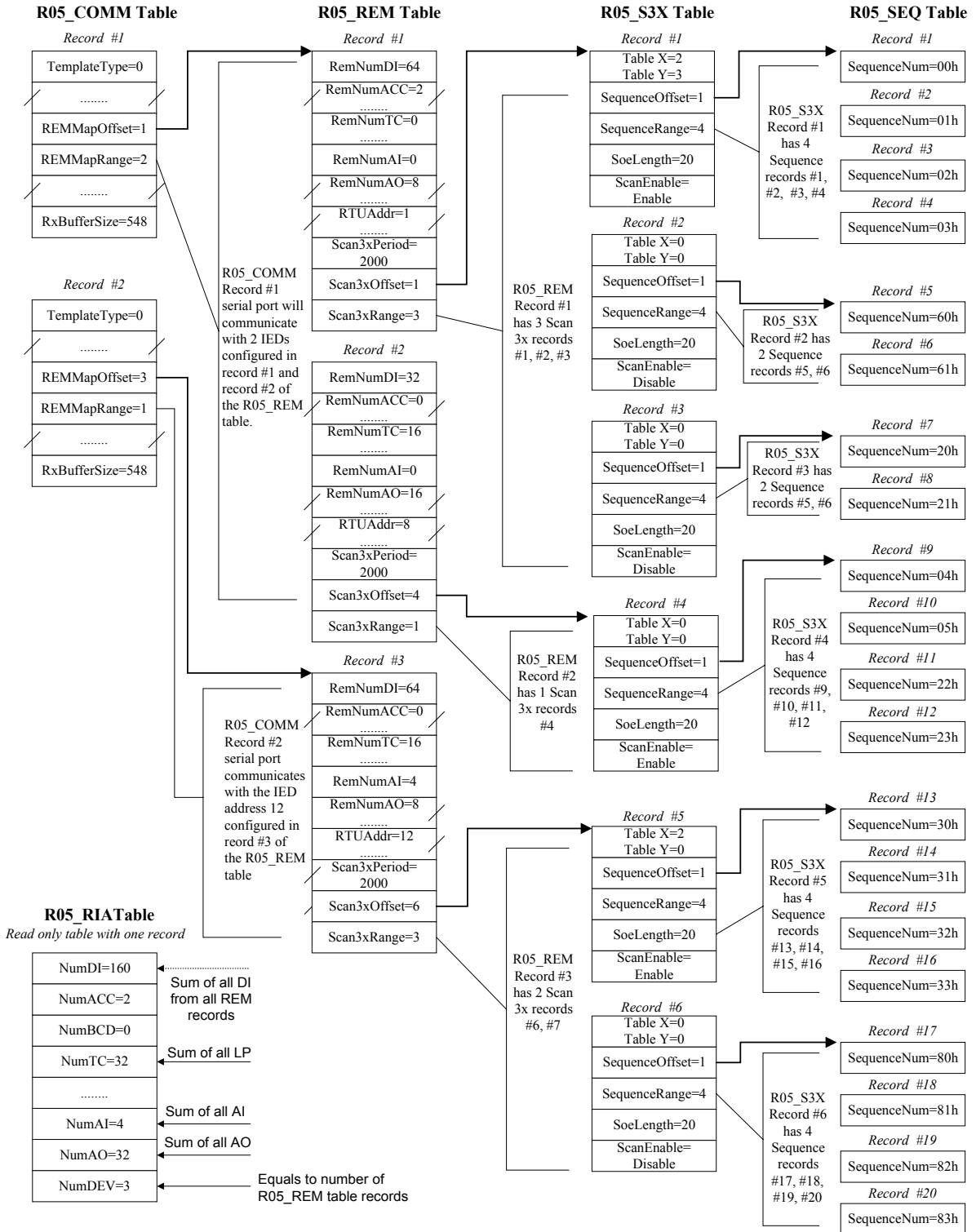


Figure 1-1: R05 Application configurable tables Relationship

2 Remote Interface Application Table (R05_RIA)

The Remote Interface Application Table (R05_RIA) is a read only table showing the total input/output points owned by the CDC Type II IED RIA application.

Table 2-1: Remote Interface Application Table (R05_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 CDC Type II IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumDI</i> in all R05_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 CDC Type II IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumACC</i> in all R05_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.
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 CDC Type II IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumTC</i> in all R05_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 CDC Type II IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumAI</i> in all R05_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 CDC Type II IED devices configured.	This is a read only field. The DynaConfig automatically sums all the <i>RemNumAO</i> in all R05_REM table records.
NumDEV	The total number of Devices owned by this RIA. This number should be equal to the total number of CDC Type II IED devices configured.	This is a read only field. The DynaConfig automatically updates this number.

3 Async and Sync Communications Table (R05 COMM)

The Asynchronous and Synchronous Communication Table (R05_RIA) 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 CDC Type II IEDs.

Table 3-1: Synchronous Communication Table (R05_COMM)

Field Name	Description	Field Type	Min Value	Max. Value	Typical Value	Note
TemplateType	Communications Template Type. Set to synchronous.	Integer	0	2	0	Read only. Set to zero
CommTimeOut	Communications time out period in milliseconds.	Long	100	4.29e09	30000	Message timeout
CommFailCtrl	Communications timeout control type.	Long Pointer	0	0	0	Read only. Not used
AckNackDelay	Time to wait for control Ack/Nack before reply.	Integer	0	65535	0	Read only Not used.
REMMap Offset	Offset into R05_REM table.	Integer	0	65535	User Configure	Zero means disabled
REMMap Range	Number of R05_REM records associated with this port.	Integer	0	65535	User Configure	Zero means disabled
TxBufferSize	Transmitting buffer size.	Integer	32	1024	256	Read only, set to 256
DataLink Layer	Data link layer name.	Appl. Name	Spare (-1)	Spare (-1)	Spare (-1)	Read only. Not Used
DataLinkTo DataLink	Data link to data link name.	Char. List	Spare	Spare	Spare	Read only. Not Used
Application Layer	Application name.	Appl. Name	Spare (-1)	Spare (-1)	Spare (-1)	Read only. Not Used
Comm Type	Type of communication.	Char. List	Async	Sync	User Configure	Select from pick list.
BaudRate	Communications baud rate.	Char. List	300	38400	9600	Can select others.
ConstDcd	DCD flag for constant or switching	Char. List	N/A	N/A	Switching	Set 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.

Field Name	Description	Field Type	Min Value	Max. Value	Typical Value	Note
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 used in asynchronous mode.	Char.	7	255	8	Should be 8 data bits. N/A for sync comm. type.
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	Char. List	N/A	N/A	Half	Half Duplex 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	Integer	2	65535	12	Depends on the configured baud rate
DcdReport	DCD signal events to be sent to this application.	Char. List	N/A	N/A	No reporting	Read only. Not used.
CtsReport	CTS signal events to be sent to this application	Char. List	N/A	N/A	No reporting	Read only. Not used.
RTUSize	Number of RTU addresses to be checked	Integer	0	65535	1	Read only. Not used.
RxBufferSize	Receiving buffer size.	Integer	32	1024	548	Ready only, Set to 548
LeadZeros	Number of leading zeros.	Integer	0	65535	8	Read only. Not used.
ShiftDir	Direction to shift bits.	Char. List	N/A	N/A	Least to Most	Read only. Not used.
InvNoninv	Determines whether bits are inverted.	Char. List	N/A	N/A	Non-inverted	Read only. Not used.
SyncChar	Sync character.	Char.	0	255	0	Read only. Not used.

Field Name	Description	Field Type	Min Value	Max. Value	Typical Value	Note
8BitTransfer	Enables/disables 8 bit transfer.	Char. List	N/A	N/A	Disable	Read only. Not used.
NumSyncIdle	Number of sync idle bits.	Integer	0	65535	2	Read only. Not used.

3.1 Character Time Out

The typical character timeout configured according to the baud rate is shown in table 3-2.

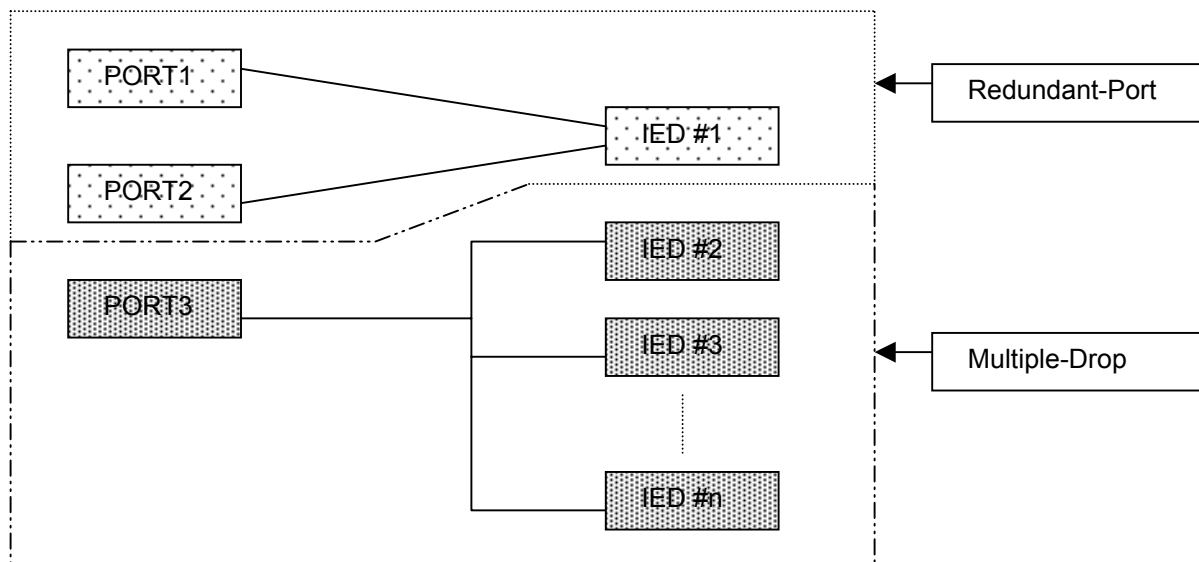
Table 3-2: Typical character timeout period based on baud rate

Communications Baud Rate	Typical Character Time
9600	3
300	60
600	30
1200	15
1800	10
2400	7
4800	5
14400	3
19200	3
28800	3
38400	3

3.2 Redundant-Port and Multiple-Drop

The redundant-port and multi-drop configurations are illustrated in figure 3-1. For redundant-port configuration the application uses two (2) communication ports communicating to one CDC Type II IED. If one communications line fails, the other can be used to poll the same IED. Multiple-Drop configuration allows the application to use the same communication port to communicate many IEDs.

Figure 3-1: Redundant-Port and Multiple-Drop Configuration



4 Remote Device Table (R05 REM)

The Remote Device Table (R05_REM) is a configurable table allowing the user to configure CDC Type II IEDs. The number of records configured should be equal to the number of GE Relays interfaced with the DS-32 RTU.

Table 4-1: Remote Device Table (R05_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 status of the CDC Type II IED. The total number of binary status should be the sum of RemNum2bc, RemNum1bc, RemNumSS, and RemNumSoe.	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 This field is always set to zero.	Integer	0	65535	0	Read only
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.	Integer	0	0	User select based on device	
RemNumAI	The total number of Analog Input points owned by this device. This number should be equal to the total number of actual values or setpoints of the CDC Type II IED configured.	Integer	0	120	User select based on device	

Field Name	Description	Type	Min	Max	Typical	Note
RemNumAO	The total number of Analog Output points owned by this device. This number should be equal to the total number of single setpoints of the CDC Type II IED configured.	Integer	0	65535	User select based on device	
RemNumDEV	The number of device is one for each CDC Type II IED	Integer	1	1	1	Read only
RemNum2bc	The total number of 2-bit change points configured for this device. This number should be equal to the largest 2-bit change number configured.	Integer	0	65535	User select based on device	
RemNum1bc	The total number of 1-bit change points configured for this device. This number should be equal to the largest 1-bit change number configured.	Integer	0	65535	User select based on device	
RemNumSS	The total number of simple status points configured for this device. This number should be equal to the largest simple status number configured.	Integer	0	65535	User select based on device	
RemNumSoe	The total number of SOE points configured for this device. This number should be equal to the number SOEs available.	Integer	0	65535	User select based on device	
RemAddr	The CDC Type II IED address.	Char.	0	15	User select based on device	Do not use 14 (reserve for broadcast)
Retries	The number of communication retries for the associated data poll	Char	0	255	2	
ReinitPeriod	Re-init Polling time interval (milliseconds)	Long	0	4.29e9	10000	
TimeSyncPeriod	Time Sync Polling time interval (milliseconds)	Long	0	4.29e9	60000	
Scan3xPeriod	Scan 3x Polling time interval (milliseconds)	Long	0	4.29e9	5000	
Scan3xOffset	The offset into the R05_S3X table	Integer	0	65535	User select	Zero means disabled
Scan3xRange	Number of data polls (R05_S3X) associated with the remote device.	Integer	0	65535	User select	Zero means disabled
AiRange	Analog input Scaling 'Range' parameter. Linear scaling formula: $Y = aX / b + c$. Where $a = AiRange$	Long	-32768	32767	32767	

Field Name	Description	Type	Min	Max	Typical	Note
AiDivisor	Analog input Scaling 'Divisor' parameter. Linear scaling formula: $Y = aX / b + c$. Where $b = \text{AiDivisor}$.	Long	-32768	32767	2047	
AiOffset	Analog input Scaling 'Offset' parameter. Linear scaling formula: $Y = aX / b + c$. Where $c = \text{AiOffset}$.	Long	-32768	32767	0	
AccType	Accumulator Type: Pulse or Transition	Char List	Pulse	Transition	Pulse	Apply to all Acc of each remote

5 Scan 3x Table (R05_S3X)

The Scan 3x Table (R05_S3X) is a configurable table allowing the user to configure the Scan 3x polls for each associated remote device.

Table 5-1: Data Poll Table (R05_S3X)

Field Name	Description	Type	Min	Max	Typical	Note
Table X	Table X associated with the current table.	Char	0	15	0	Zero disables table X
Table Y	Table Y associated with the current table.	Char	0	15	0	Zero disables table Y
Sequence Offset	The offset into the sequence table.	Integer	0	65535	User select	Zero means disabled
Sequence Range	The number of sequences associated with the current table.	Integer	0	65535	User select	Zero means disabled
SOE Length	The number of data words allocated for SOE data in the Scan 3x response of the current table.	Char	0	255	Depends on the number sequences	
Scan Enable	Enables/Disable scanning of the current table.	Char	Disable	Enable	User select	

6 Sequence Table (R05_SEQ)

The Sequence Table (R05_SEQ) is a configurable table allowing the user to configure the data polls for each associated remote device.

Table 6-1: Data Poll Table (R05_S3X)

Field Name	Description	Type	Min	Max	Note
Sequence Number	The sequence number to scan for.	Char	0	0xFF	2 bit: 0 – 0x1F 1 bit: 0x20 – 0x2F SS: 0x30 – 0x3F ACC: 0x40 – 0x5F FACC: 0x60 – 0x7F AI: 0x80 – 0xFF