Installation and Operating Handbook

TLTR3100 Test Loop Translator

Covers options: 3f, 4, 9, 12b

Document Issue v1.01, July 30, 2020

CE 1997

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Certificate Number 2400
ISO 9001

IMPORTANT NOTE: THE INFORMATION AND SPECIFICATIONS CONTAINED IN THIS DOCUMENT SUPERSEDES ALL PREVIOUSLY PUBLISHED INFORMATION CONCERNING THESE PRODUCTS

PEAK COMMUNICATIONS Ltd maintains a continuing programme of product improvement and therefore reserves the right to change specifications without notice

PeakManual:v1.52, ODUManual:v1.55, ODUPowerConnectors:v1.26, ODURedundancy:v1.1

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Preface

The Peak Communications TLTR3100 Installation and Operating Handbook provides information on installation and use of the TLTR3100 unit.

This manual is of a technical nature and is intended for technicians, engineers and service personal.

The main body of the manual takes the user through the unit and its uses. The appendices include, generic overall dimensioning information (with mounting).

Customer Care

Contact the Peak Communications support department for:

- Product operation, application support or training requests
- Information for returning or upgrading a product
- Comments or suggestions on any supplied literature

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To return a Peak Communications product for repair:

1. Contact the Peak Communications support department and request a Return Material Authorisation (RMA) number.
2. You will be required to provide to our support representative the model number, serial number and a detailed description of the problem.
3. To prevent any damage to the product during shipment we recommend that the unit is returned in its original packaging or if this is not available the packaging used must be of an equal standard.
4. Return the product back to Peak Communications and advise shipment details to sales representative for tracking purposes. (Any shipping charges should be prepaid)

Product Compliance

Safety

To ensure safety of the operator the TLTR3100 series of units have been designed to comply with the following safety standard;

EN 60950: Safety of information technology equipment, including electrical business machines.

Operation of the equipment in a non standard manner will invalidate compliance to this standard. The equipment MUST BE OPERATED WITH ITS LID ON AT ALL TIMES. If it is necessary to remove the lid for any purpose then it is essential that the lid is fitted back correctly before normal operation.

DEPENDANT UPON UNIT TYPE, DANGEROUS VOLTAGES MAY BE PRESENT AROUND THE POWER SUPPLY AND PRECAUTIONS MUST BE TAKEN.

THE EQUIPMENT IS MEANT TO BE OPERATED BY TRAINED PERSONNEL ONLY.

EMC

The TLTR3100 units have been designed to comply with the following standards;

Emissions

EN 55022 Class B: Limits and methods of measurement of radio interference characteristics of Information Technology Equipment.

Immunity

EN 50082 Part 1: Generic immunity standard, part 1: Domestic, commercial and light industrial environment.

Damage to the chassis, controls or interfaces will invalidate compliance; please contact the factory under these circumstances for advice on continued operation. Interfaces to the TLTR3100 series of units must be made with suitably screened connectors and double screened coaxial cable. Data cables must be double screened.

Section 1

Unit Description

The TLTR3100 remote mounted Test Loop Translator from Peak Communications are designed to be fully compatible with a wide range of equipment, to provide a monitor path from the output of the SHF amplifier. These high grade units are designed to accept the signal at SHF and provide a further conversion to the appropriate output band.

The TLTR3100 are designed to operate over a wide range of SHF power level inputs. The internal construction of the unit is modular which gives some flexibility in accommodating customers' requirements such as gain and frequency. The unit is powered from the Power / Alarms / Remote connector (see section 1.4).

The incoming RF is passed to the mixer which is fed with an LO which is in turn referenced from an internally fitted OCXO. At all stages the components have isolators and attenuators to ensure correct matching is maintained. The receive band signal is then passed out to the RF Out connector with no filtering unless this has been specified.

The TLTR3100 units are not fitted with amplifiers as standard and have a through loss of 20dB nominal. Maximum input power with no damage is standard at +15dBm with a non compressed signal level of above 5dB nominal.

The TLTR3100 has an electronically variable Ka-Band attenuator, with a range of 0 - 30 dB, and a step size of 0.125 dB.

1.1 Specification

Please refer to the TLTR3100 datasheet for the current standard performance, or contact technical support for specific technical enquiries.

1.2 Chassis

The unit is housed in a sealed die cast aluminium box. See Appendix A for the dimensions details.

1.3 Mounting

The unit comes with two mounting options:

Flat surface

Two small brackets are supplied for fixing of the unit to a flat surface. The brackets need to be screwed to the unit's underside in the appropriate place.

Pole

A kit to mount the unit to a circular pole is supplied.

See Appendix A for details.

1.4 Connections

Figure 1.1 shows a connector view.

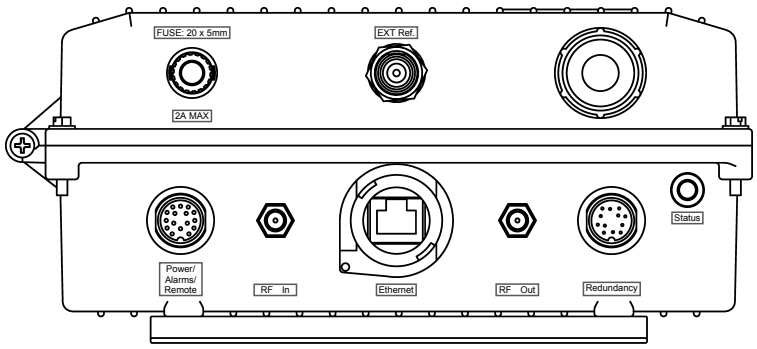


Figure 1.1: Connector view

Breather
Immersion proof breather.

Fuse
The main DC power supply fuse, bulkhead mounting 20mm x 5mm 1 Amp removable by turning.

Power / Alarms / Remote
16 Way male circular on the chassis with connections as shown in table 1.2. The cable must be rated to cope with 1 Amp continuous use. The alarm contacts are from a dry contact relay, the ratings of which are shown in table 1.3

Redundancy
12 Way circular connector on the chassis with connections as shown in table 1.4. The 'Ethernet reset' pin, when shorted to Ground will flash the main unit LED for $\approx$ 5 seconds, after this time the unit will restart with the static Ethernet IP settings as shown in table 1.1.

Note that the ethernet reset pins must not be connected to any pin other than ground or permanent damage will occur.

Table 1.1: Ethernet reset settings

Parameter	Setting
IP address	192.168.0.2
Subnet Mask	255.255.255.000
Gateway	192.168.0.1

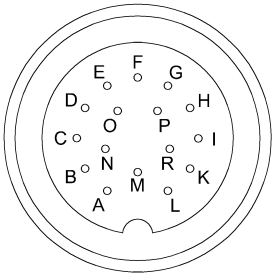
Ethernet
Sealed RJ45 connector, the cover of which must remain in place to keep the IP rating when not in use.

RF In
K-Type connector.

RF Out
K-Type connector.

EXT Ref.
TNC connector, input at 10MHz $\pm$ 3dBm.

Table 1.2: Power / Alarms / Remote pinout



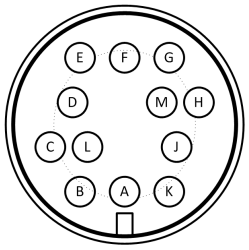
16 Way male circular

Pin Number	Function
A	Chassis Ground
B	RS232 Rx
C	RS232 Tx
D	RS485 Tx +
E	RS485 Tx -
F	RS485 Rx -
G	RS485 Rx +
H	Not used
I	Not used
K	Not used
L	Not used
M	Alarm N/C
N	Alarm common
O	Alarm N/O
P	Chassis Ground
R	DC supply (+16.5 V to +35 V DC)

Table 1.3: Relay ratings

Parameter	Rating
Switch voltage (max.)	100V
Switch current (max.)	0.5A
Switch power (max.)	10W
Contact resistance	0.2Ω
Operate / release	0.5mS

Table 1.4: Redundancy pinout



12 Way circular connector

Pin Number	Function
A	Not used
B	Ground
C	Not used
D	Not used
E	Ground
F	Not used
G	Not used
H	Not used
J	Not used
K	Not used
L	Not used
M	Ethernet reset

1.5 Status LED

The status LED, shows the status of the TLTR3100 unit. Table 1.5 shows the different LED colours and their associated status meaning.

Table 1.5: Status LED

Colour	Status
Green	OK and Online
Red	Summary alarm

Section 2

Operation

Attach the feed wire carrying the RF signal to the socket marked ’RF In’. Output of the unit is a K-Type socket marked ’RF Out’. Check out all cables for shorts before connecting and ensure the connections are weather-proofed. DC must not be introduced to the RF input or output connectors.

Section 3

Remote Control

This section describes the various ways it is possible to monitor and control the TLTR3100 unit.

3.1 Serial Communications RS232 / RS485

The TLTR3100 unit is capable of being controlled remotely using the P7xxx protocol format as described in section 3.2, through the RS232 / 485 connection, the baudrate of which is variable and is setup via one of the remote control interfaces.

3.2 P7xxx Protocol

The TLTR3100 transmits and receives data serially in an asynchronous format using the ASCII character set (includes the extended ASCII set). The serial data consists of message frames composed of the following message characters:

STX, number of bytes, unit address, instruction number, message body, checksum, ETX.

All characters are compulsory except for the message body. The presence of a message body is determined by the message type (instruction number). The total number of message characters in a message frame may range from a minimum of 6 to a maximum of 255. All messages to and from the unit follow the protocol, as described in table 3.1, with a character format of 8 data bits, one stop bit, no parity, baud rate selectable. Note that all numeric values are shown as decimal unless otherwise stated.

Table 3.1: P7xxx protocol

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX Start of message character #02
2	n	1	Number of bytes Character defining how many characters are in the message including the STX & ETX parts
3	32	1	Unit address Address ranges from character 001 to 255 (decimal)
4	21	1	Instruction number Used to specify the type of message to or from the unit
...	. . .	...	Message body This is an optional set of data that is used in conjunction with the instruction type. It can be 0 bytes in length upwards, all subject to the instruction number
n-1	?	1	Checksum The checksum is used to verify the accuracy of the message frame. The checksum is defined as the summation of all the bytes in the message, beginning with the 3rd byte (Unit address) and extending through the body of the message, ending with the last byte before the checksum. The total of the bytes is then ANDed with 255 so that the checksum is truncated to a single byte
n	03	1	ETX End of transmission character #03

3.2.1 Attenuator

This group of remote messages allow the user to monitor and control the channel attenuator of the TLTR3100 unit. In order for the unit to accept changes made via the remote control it must be placed in remote mode.

Table 3.2: Attenuator instruction list

To unit	From unit	Description
20		Attenuator status request
	21	Attenuator status response
22		Attenuator change request

3.2.1.1 Instruction 20 (Attenuator status request)

Table 3.3: Attenuator status request message format (instruction 20)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	7	1	Number of bytes
3	32	1	Unit address
4	20	1	Instruction number
5	'L'	1	Test loop translator
6	?	1	Checksum
7	03	1	ETX

3.2.1.2 Instruction 21 (Attenuator status response)

Table 3.4: Attenuator status response message format (instruction 21)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	13	1	Number of bytes
3	32	1	Unit address
4	21	1	Instruction number
5	'L'	1	Test loop translator
6	'+11500 = 11.500dB'	6	Attenuation in 0.001dB steps Attenuator only capable of 0.125dB steps
12	?	1	Checksum
13	03	1	ETX

3.2.1.3 Instruction 22 (Attenuator change request)

Table 3.5: Attenuator change request message format (instruction 22)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	13	1	Number of bytes
3	32	1	Unit address
4	22	1	Instruction number
5	'L'	1	Test loop translator
6	'+11500 = 11.500dB'	6	Attenuation in 0.001dB steps Attenuator only capable of 0.125dB steps
12	?	1	Checksum
13	03	1	ETX

3.2.2 Unit

This group of remote messages allow the user to monitor the unit/main status part of the TLTR3100 unit.

Table 3.6: Unit instruction list

To unit	From unit	Description
40		Unit status request
	41	Unit status response

3.2.2.1 Instruction 40 (Unit status request)

Table 3.7: Unit status request message format (instruction 40)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	6	1	Number of bytes
3	32	1	Unit address
4	40	1	Instruction number
5	?	1	Checksum
6	03	1	ETX

3.2.2.2 Instruction 41 (Unit status request response)

Table 3.8: Unit status request response message format (instruction 41)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	68	1	Number of bytes
3	32	1	Unit address
4	41	1	Instruction number
5	'TLTR3100 [3f 4]'	27	Type of unit this is: TLTR3100 [3f 4]
32	'01234'	5	Serial number
37	'0112.34'	7	Software version number
44	'0'	1	Summary alarm '0' = Ok '1' = Fault
45	'0'	1	PLO1 fault '0' = Ok '1' = Fault
46	'0'	1	PLO2 fault '0' = Ok '1' = Fault
47	'23/12/02 12:34:56'	17	OK Since time/date string If there is a fault with this part of the unit then the string is blank
64	'1'	1	1:1 status '0' = Offline '1' = Online
65	'1'	1	Remote mode '0' = Local '1' = Remote
66	'0'	1	External reference On/Off '0' = Off '1' = On
67	?	1	Checksum
68	03	1	ETX

3.2.3 Serial Communications Settings

Due to the lack of a front panel on the TLTR3100 series of converters it is possible to change their address, baudrate and whether they use RS232 or RS485 communications via a serial message. The TLTR3100 will change its serial configuration only if all the settings are valid in the message.

Table 3.9: Serial communications settings instruction list

To unit	From unit	Description
26		Serial communications settings change request

3.2.3.1 Instruction 26 (Serial Communications Settings Change Request)

Table 3.10: Serial Communications Settings Change Request message format (instruction 26)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	9	1	Number of bytes
3	32	1	Unit address
4	26	1	Instruction number
5	'2'	1	RS232/RS485 selection '2' = RS232 '4' = RS485
6	43	1	Address Valid character range is 1 to 255(incl.)
7	'5'	1	Baudrate '1' = 300 '2' = 1200 '3' = 2400 '4' = 4800 '5' = 9600 '6' = 19200
8	?	1	Checksum
9	03	1	ETX

3.2.4 Ethernet Settings

This group of remote messages allow the user to monitor and control the ethernet settings of the TLTR3100 unit. Unlike most other messages these messages consist of a Instruction and a subInstruction. The unit also does not have to be in remote mode for these messages to take affect. Care should be taken when using these messages as it is possible to put the unit in a state that one wasn't necessarily expecting.

Table 3.11: Ethernet Settings instruction list

To unit	From unit	Description
4 - '1'		Ethernet settings status request
	5 - '1'	Ethernet settings status response
	6 - '1'	Ethernet settings change request

3.2.4.1 Instruction 4, Sub Instruction ’1’ (Ethernet Status Request)

Table 3.12: Ethernet Status Request message format (instruction 4, sub instruction ’1’)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	7	1	Number of bytes
3	32	1	Unit address
4	4	1	Instruction number
5	'1'	1	Sub instruction
6	?	1	Checksum
7	03	1	ETX

3.2.4.2 Instruction 5, Sub Instruction ’1’ (Ethernet Status Response)

Table 3.13: Ethernet Status Response message format (instruction 5, sub instruction ’1’)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	74	1	Number of bytes
3	32	1	Unit address
4	5	1	Instruction number
5	'1'	1	Sub instruction
6	'1'	1	DHCP ’0’ = Disabled ’1’ = Enabled
7	'_'	1	Separator character
8	'192.168.000.025'	15	IPv4 address
23	'_'	1	Separator character
24	'255.255.255.000'	15	Subnet mask
39	'_'	1	Separator character
40	'192.168.000.010'	15	Gateway mask
55	'_'	1	Separator character
56	'1'	1	SNMP ’0’ = Disabled ’1’ = Enabled
57	'_'	1	Separator character
58	'192.168.000.032'	15	SNMP trap address
73	?	1	Checksum
74	03	1	ETX

3.2.4.3 Instruction 6, Sub Instruction ’1’ (Ethernet Change Request)

This message is sent to the unit, when the host computer wishes to change the Ethernet settings of the TLTR3100 unit. The unit does not need to be in remote mode for this to be achieved.

Table 3.14: Ethernet Change Request message format (instruction 6, sub instruction ’1’)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	74	1	Number of bytes
3	32	1	Unit address
4	6	1	Instruction number
5	'1'	1	Sub instruction
6	'1'	1	DHCP ’0’ = Disabled ’1’ = Enabled
7	'_'	1	Separator character
8	'192.168.000.025'	15	IPv4 address
23	'_'	1	Separator character
24	'255.255.255.000'	15	Subnet mask
39	'_'	1	Separator character
40	'192.168.000.010'	15	Gateway mask
55	'_'	1	Separator character
56	'1'	1	SNMP ’0’ = Disabled ’1’ = Enabled
57	'_'	1	Separator character
58	'192.168.000.032'	15	SNMP trap address
73	?	1	Checksum
74	03	1	ETX

3.2.5 TCP Port Settings

This group of remote messages allow the user to monitor and control the TCP port settings of the TLTR3100 unit. Unlike most other messages these messages consist of a Instruction and a subInstruction. The unit also does not have to be in remote mode for these messages to take affect. Care should be taken when using these messages as it is possible to put the unit in a state that one wasn't necessarily expecting.

Table 3.15: TCP Port Settings instruction list

To unit	From unit	Description
4 - '2'		TCP port settings status request
	5 - '2'	TCP port settings status response
	6 - '2'	TCP port settings change request

3.2.5.1 Instruction 4, Sub Instruction ’2’ (TCP Port Status Request)

Table 3.16: TCP Port Status Request message format (instruction 4, sub instruction ’2’)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	7	1	Number of bytes
3	32	1	Unit address
4	4	1	Instruction number
5	'2'	1	Sub instruction
6	?	1	Checksum
7	03	1	ETX

3.2.5.2 Instruction 5, Sub Instruction ’2’ (TCP Port Status Response)

Table 3.17: TCP Port Status Response message format (instruction 5, sub instruction ’2’)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	18	1	Number of bytes
3	32	1	Unit address
4	5	1	Instruction number
5	'2'	1	Sub instruction
6	'04000'	5	TCP port number
11	'.'	1	Separator character
12	'00010'	5	TCP socket timeout in seconds
17	?	1	Checksum
18	03	1	ETX

3.2.5.3 Instruction 6, Sub Instruction ’2’ (TCP Port Change Request)

This message is sent to the unit, when the host computer wishes to change the TCP Port settings of the TLTR3100 unit. The unit does not need to be in remote mode for this to be achieved.

Table 3.18: TCP Port Change Request message format (instruction 6, sub instruction ’2’)

Message byte no.	Set value / example	Length (bytes)	Description
1	02	1	STX
2	18	1	Number of bytes
3	32	1	Unit address
4	6	1	Instruction number
5	'2'	1	Sub instruction
6	'04000'	5	TCP port number
11	'.'	1	Separator character
12	'00010'	5	TCP socket timeout in seconds
17	?	1	Checksum
18	03	1	ETX

3.3 Ethernet

If the TLTR3100 unit has been fitted with the Ethernet option the unit can be controlled via its in built web server, TCP or SNMP.

Due to a lack of front panel on these units, it is not possible to display the IP address and other Ethernet settings to the user easily. In order to discover the IP address and other Ethernet settings, initially only, the ethernet discovery windows programme needs to be run. This software is available from the Peak Communications website. When run it lists the units on the network, and allows the user to view and modify, if necessary, the Ethernet settings to suit the user’s network, see figure 3.1.

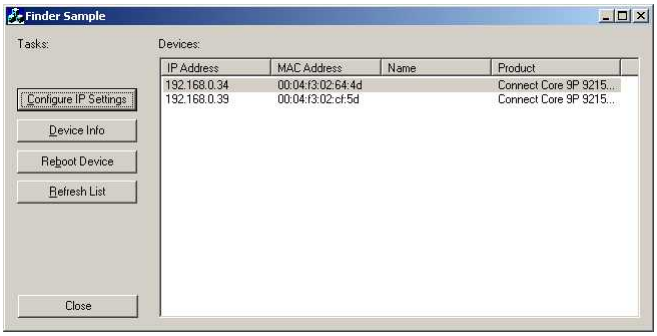


Figure 3.1: Ethernet discovery

The ’Configure IP Settings’ button brings up the window as shown in figure 3.2. This allows the changing of the Ethernet settings, the password is ”PEAKpass123”, it is case sensitive.

The TLTR3100 units do leave the factory in DHCP mode, as such they need to be setup via a DHCP network. If this isn’t available then it is possible to force the unit onto a static IP address, see the Ethernet Reset pin’s details on page 2.

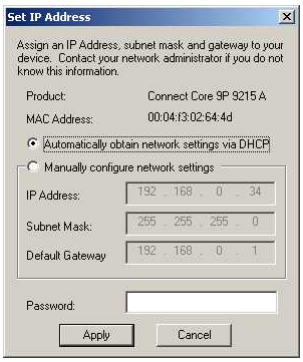


Figure 3.2: Configure IP settings window

3.3.1 Webserver

The webpage used to control the TLTR3100 unit is essentially split into two screens, Status and Configure. Each one accessible via the links part way down the screen. The webpage is displayed by entering the TLTR3100 unit's IP address into a normal web browser. Figure 3.3 shows a typical web page view, note this may not represent this particular unit.

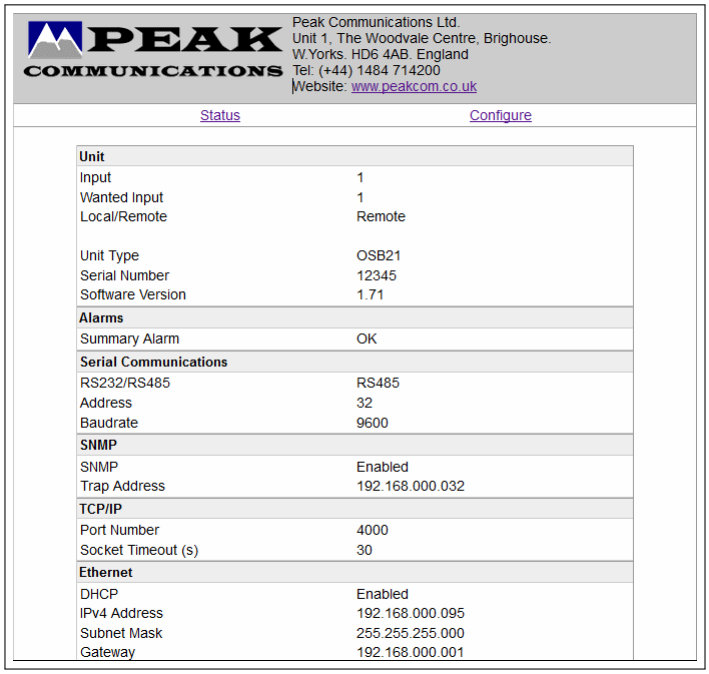


Figure 3.3: Typical webpage status screen

3.3.2 TCP

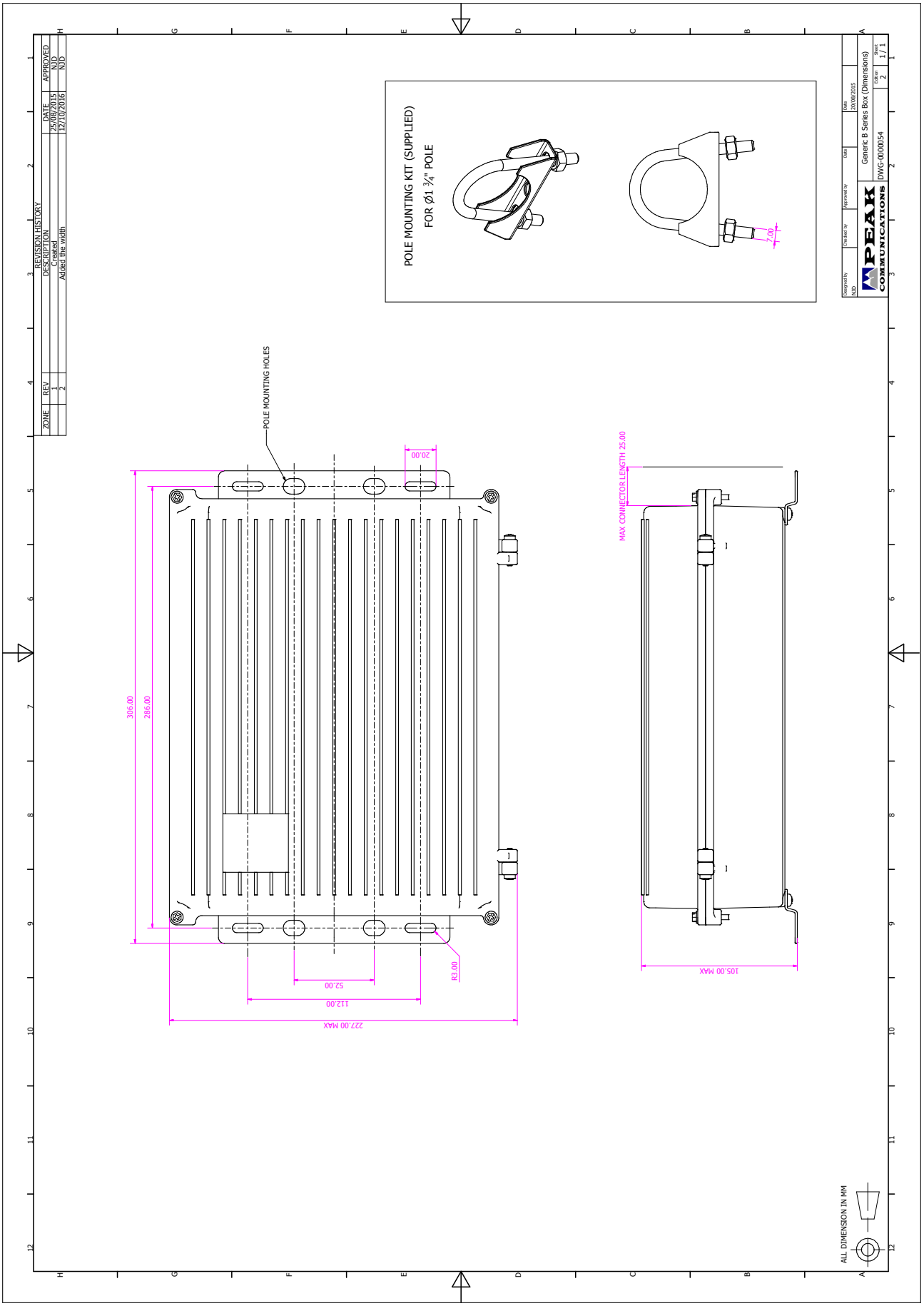
The TLTR3100 unit can be controlled via TCP, this involves sending the normal RS232 / 485 commands to the unit through a TCP port. The TCP port to be used is set by the user via one of the remote control interfaces. The remote control protocol that can be used with the unit is shown in section 3.2.

3.3.3 SNMP

The TLTR3100 units can be controlled via SNMP via the built-in SNMP (Simple Network Management Protocol) agent software. It supports SNMP Trap, RFC1155, 1157, 1212, 1213, 1901 & 1906, as well as the Peak MIBS. The MIBS necessary for this are available from the Peak Communications website. Please refer to the Peak-Agents.MIB file, as this shows which of the MIBS available are used for this TLTR3100 unit.

Appendix A

Mounting Drawings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REV
DESCRIPTION
Created
Added the width
DATE
25/08/2015
12/10/2016
APPROVED
NJD
NJD
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FOR Ø1 ¾" POLE
7.00
POLE MOUNTING HOLES
20.00
306.00
286.00
52.00
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227.00 MAX
R3.00
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105.00 MAX
PEAK COMMUNICATIONS
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ALL DIMENSION IN MM