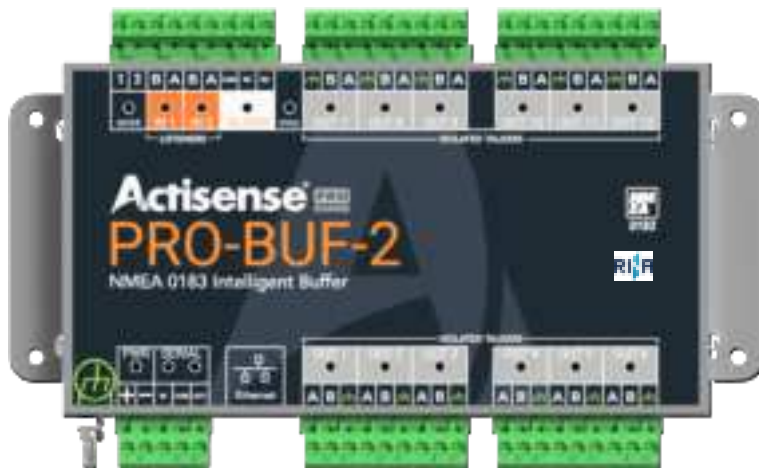


Actisense PRO-Range products

Configuration Manual

- PRO-BUF-2 - NMEA 0183 Buffer 
- PRO-MUX-2 - NMEA 0183 Multiplexer 
- PRO-NDC-1E - NMEA 0183 Multiplexer 
- PRO-NDC-1E2K - NMEA 0183 Multiplexer  



Important Notices

The device to which this manual relates complies with the Electromagnetic Compatibility requirements according to IEC 60945:2002-08, DNVGL-CG-0339:2019 & IACS UR E10 Rev7. The unit should always be used in conjunction with appropriately approved, shielded cable and connectors as per NMEA 0400 to ensure compliance. A declaration of conformity is available for download at www.actisense.com.

If the device to which this manual relates is to be installed within five metres of a compass, please refer to the 'Compass Safe Distance' section in the 'Technical Specifications' table.

Trademarks and Registered Trademarks

Actisense® and the Actisense logo are registered trademarks of Active Research Limited (Ltd). All other trademarks are the property of their respective owners.

The NMEA® name and NMEA logo are copyright held by the NMEA. All uses in this manual are by permission and no claim on the right to the NMEA name or logo are made in this manual.

Fair Use Statement

The contents of this manual may not be transferred or copied without the express written permission of Active Research Ltd. Copyright © 2021 Active Research Ltd. All rights reserved.

Technical Accuracy

To the best of our knowledge the information contained in this document was correct at the time it was produced. Active Research Ltd cannot accept liability for any inaccuracies or omissions.

The products described in this manual and the specifications thereof may be changed without prior notice. Active Research Ltd cannot accept any liability for differences between the product and this document. To check for updated information and specifications please check www.actisense.com.

Active Research Ltd will not be liable for infringement of copyright, industrial property rights, or other rights of a third party caused by the use of information or drawings described in this manual.

Product Registration

Please register your product via the online form at <https://actisense.com/product-registration>

Your product package includes a unit serial number. The serial number is six digits long and

can be found below the barcode on the label. Your registration will assist Actisense Support to link your product to your details, simplifying any future assistance you may require.

Product Guarantee

All Actisense products are provided with a 5 year guarantee upon registration. To register your product, visit <https://actisense.com/product-registration>.

If you suspect that the unit is faulty please refer to the Troubleshooting Section of the User Manual before contacting support.

It is a requirement of the guarantee that all installations of electronic equipment follow the NMEA 0400 specification. Any connection to a battery or power supply must meet the mandatory essential safety requirements that may be imposed by local regulatory agencies.

Actisense products are intended for use in a marine environment, primarily for below deck use. If a product is to be used in a more severe environment, such use may be considered misuse under the Active Research Ltd guarantee.

Product Disposal

Please dispose of this product in accordance with the WEEE Directive. The product should be taken to a registered establishment for the disposal of electronic equipment.

Contents Page

Introduction.....	4
Accessing PRO-range products via a network.....	5
The PRO- range home page.....	6
Information Icon.....	6
Status Icon.....	7
Settings Icon.....	10
Planning your NMEA 0183 network.....	11
Configuring Input from 'Talkers'.....	11
Configuring Output to 'Listeners'.....	12
Routing of Input and Output Data.....	14
Basic Routing.....	15
NMEA 2000 Output.....	TBC
Autoswitching.....	16
Advanced Routing.....	17-18
Alarm connections & configuration.....	19
Troubleshooting Guide.....	19

Introduction

This manual contains instructions for configuring the following PRO range of products from Actisense.

- **PRO-BUF-2** NMEA0183 Intelligent Buffer 
- **PRO-MUX-2** NMEA0183 Intelligent Multiplexer 
- **PRO-NDC-1E** NMEA0183 Intelligent Multiplexer 
- **PRO-NDC-1E2K** NMEA0183 Multiplexer / NMEA 2000 Gateway  

Please read through this manual carefully to realise the full potential of your new PRO product. This manual should be read in conjunction with the individual user/install manual available from the Actisense website at <http://www.actisense.com>

Built into the firmware of each PRO range products is a web-based configuration app. that allows the set-up to be tailored to your individual needs from any internet browser.

Please Note : Since the products listed above have slightly different features, some of the screen shots contained within this manual will look different to the observed behaviour when a user configures their own PRO-range device, but the overall 'look and feel' will be the same as shown in the following pages. Specific features which are not available are highlighted in the table below.

Each PRO range product has it's own installation manual where all the technical specifications, information on connectivity, and wiring details for each device can be found. Please visit our website <https://actisense.com> for the individual install manuals relating to your own product.

PRO-Range products at a glance

Product	PRO-BUF-2	PRO-MUX-2	PRO-NDC-1E	PRO-NDC-1E2K
 Inputs	2	8	2	2
 Outputs	12	6	5	5
Serial Ports	1	1	1	1
Ethernet(servers)	YES(2)	YES(4)	YES(2)	YES(2)
 NMEA 2000	NO	NO	NO	YES
Alarms	YES	YES	NO	NO

Accessing the PRO range of products via an ethernet network

The PRO range can be connected to your network in one of two ways.

1: Standard Ethernet Networks

- If the PRO product is connected to an ethernet network containing both DHCP and DNS servers, launch any of the popular web browsers.
- Replacing 'xxxxxx' with the serial number of your PRO product, found on the side of the case, type one of the following commands into the address bar depending on the product you have.
- **<http://probuf-xxxxxx>**
- **<http://promux-xxxxxx>**
- **<http://prondc-xxxxxx>** (NOTE : Both variants of PRO-NDC use the same wording)

2: Direct connection or basic ethernet networks

- If the PRO product is connected directly to a PC or the ethernet network does not have a DHCP server, the device will communicate using the auto-IP by default.
- The auto-IP process can take up to 60 seconds to complete.
- The PC's 'Local Area Connection' must also be set-up to use auto-IP in order to communicate on this network. Most PC's are set-up to do this by default. If needed, instructions on how to do this using Windows 10 are given in the user/install manual (other Windows operating systems will be similar). These can be found by visiting <https://actisense.com>

NOTE: PC administrator privileges are required to carry out these modifications.

- Once the PC and PRO product are using the same IP address range, launch any popular web browser.
- Replacing 'xxxxxx' below with the serial number of your PRO product, type in one of the following commands into the address bar depending on the product you have.
- **<http://probuf-xxxxxx>**
- **<http://promux-xxxxxx>**
- **<http://prondc-xxxxxx>** (NOTE : Both variants of PRO-NDC use the same wording)

The home-page for the PRO-MUX-2 will be as shown below. (Shown here for a PRO-MUX-2)

NOTE: You may need to refresh your browser window if the web-app does not display immediately.

NOTE: Clicking on any of the icons at this point will allow you to view the current settings of your PRO range device, but alterations are not possible until a user 'Login' is performed.

The Username is 'admin', and the default password can be found on the sticker located on the side of the product. If the password is changed, ensure to make a note of it.

The password can be altered later. The username 'admin' is static and cannot be altered.



Navigating the PRO range home-page (shown here for the PRO-MUX-2)



Information Icon



- This icon will display all the relevant technical information relating to the device itself.
- This information is important if you need to troubleshoot your device or require technical assistance at a future date.

Information

Status

Operating Mode:
Combine 1

Battery Voltage:
11.86

Log:
Disabled

Uptime:
0:04:15:25

Device

Model ID:
PRO-MUX-2

Serial Number:
718

Date & Time of manufacture:
05/05/2022, 10:37:42

Hardware ID:
080104

Firmware version:
2.434

Date & Time of Firmware:
01/09/2022, 06:45:44

Firmware CRC:
0xED315DCB

Bootloader version:
1.080

Bootloader CRC:
0x12345678

Web UI version:
0.246

Ethernet Status

MAC Address:
70-B3-D5-6A-0D-8D

Address:
192.168.0.92

Subnet:
255.255.255.0

Gateway:
192.168.0.254

Host Name:
promux-718

HTTP Port:
80

DHCP:
Enabled

Status Icon



- This icon displays the current status of all the various user controlled settings:
- **Data Servers:** Displays the following information relating to the data server if enabled.

Data ServersSerial

Data Server 1

Enabled: Yes

Status: Open

Port: 60001

Protocol: TCP

Data Format: NMEA0183

Rx Avg Bytes/s: 0

Total Rx Bytes: 0

Rx Dropped Bytes/s: 0

Rx Total Dropped: 0

Tx Bytes Total: 0

TCP Client Connections: 0

Disconnect Count: 0

- **Serial:** Displays the current status of all the serial ports, including their baud rate, alias name if applied, port direction and the current data load on each port.

Serial Ports	Name	Mode	Speed	Direction	Load	
000000			115200		0%	
R11		Manual	4000		0%	
R12		Manual	4000		0%	
R13		Manual	4000		0%	
R14		Manual	4000		0%	
R15			4000		0%	
R16			4000		0%	
R17			4000		0%	
R18			4000		0%	
OUT1		3	38400		0%	
OUT2		3	4000		0%	
OUT3		3	4000		0%	
OUT4		3	4000		0%	
OUT5		3	4000		0%	
OUT6		3	4000		0%	
OUT7					0%	

- **Detailed Stats:** Once the PRO device is operational, this page will show the number of individual sentences being received or transmitted over a 10 second period. The picture below shows a simple case of GPS sentences being sent and received. Once the device has more inputs and outputs enabled this will contain all the sentences being routed through the device.
- **Messages being received from talkers**

Data Servers	Serial	Detailed Stats	Routing	Alarms
Time Period: 10 secs				
		IN1-GPS	IN2	IN3
GPDTM	10			
GPGGA	10			
GPGLL	10			
GPGSA	10			
GPGSV	10			
GPRMC	9			
GPVTG	10			
GPZDA	0			

- **Messages being transmitted to listeners**

Data Servers	Serial	Detailed Stats	Routing	Alarms
Time Period: 10 secs				
		SERIAL	OUT1-GPS	
MXTXT	0			
GPGLL			10	
GPRMC			10	
GPVTG			10	
GPZDA			0	
GPGGA			10	
GPGSA			10	
GPGSV			10	
GPDTM			10	

- **Routing:** Matrix showing data flow between inputs and outputs

Routing Settings

ADW1

AUG

ADW2

AUG

Destination

Source

SERIAL

OUT1

OUT2

OUT3

OUT4

OUT5

OUT6

OUT7

Event

Range

DIG1

DIG2

DIG3

DIG4

SERIAL

OUT1

OUT2

OUT3

OUT4

OUT5

OUT6

OUT7

OUT8

OUT9

OUT10

OUT11

OUT12

OUT13

OUT14

OUT15

OUT16

OUT17

OUT18

OUT19

OUT20

OUT21

OUT22

OUT23

OUT24

OUT25

OUT26

OUT27

OUT28

OUT29

OUT30

OUT31

OUT32

OUT33

OUT34

OUT35

OUT36

OUT37

OUT38

OUT39

OUT40

OUT41

OUT42

OUT43

OUT44

OUT45

OUT46

OUT47

OUT48

OUT49

OUT50

OUT51

OUT52

OUT53

OUT54

OUT55

OUT56

OUT57

OUT58

OUT59

OUT60

OUT61

OUT62

OUT63

OUT64

OUT65

OUT66

OUT67

OUT68

OUT69

OUT70

OUT71

OUT72

OUT73

OUT74

OUT75

OUT76

OUT77

OUT78

OUT79

OUT80

OUT81

OUT82

OUT83

OUT84

OUT85

OUT86

OUT87

OUT88

OUT89

OUT90

OUT91

OUT92

OUT93

OUT94

OUT95

OUT96

OUT97

OUT98

OUT99

OUT100

OUT101

OUT102

OUT103

OUT104

OUT105

OUT106

OUT107

OUT108

OUT109

OUT110

OUT111

OUT112

OUT113

OUT114

OUT115

OUT116

OUT117

OUT118

OUT119

OUT120

OUT121

OUT122

OUT123

OUT124

OUT125

OUT126

OUT127

OUT128

OUT129

OUT130

OUT131

OUT132

OUT133

OUT134

OUT135

OUT136

OUT137

OUT138

OUT139

OUT140

OUT141

OUT142

OUT143

OUT144

OUT145

OUT146

OUT147

OUT148

OUT149

OUT150

OUT151

OUT152

OUT153

OUT154

OUT155

OUT156

OUT157

OUT158

OUT159

OUT160

OUT161

OUT162

OUT163

OUT164

OUT165

OUT166

OUT167

OUT168

OUT169

OUT170

OUT171

OUT172

OUT173

OUT174

OUT175

OUT176

OUT177

OUT178

OUT179

OUT180

OUT181

OUT182

OUT183

OUT184

OUT185

OUT186

OUT187

OUT188

OUT189

OUT190

OUT191

OUT192

OUT193

OUT194

OUT195

OUT196

OUT197

OUT198

OUT199

OUT200

OUT201

OUT202

OUT203

OUT204

OUT205

OUT206

OUT207

OUT208

OUT209

OUT210

OUT211

OUT212

OUT213

OUT214

OUT215

OUT216

OUT217

OUT218

OUT219

OUT220

OUT221

OUT222

OUT223

OUT224

OUT225

OUT226

OUT227

OUT228

OUT229

OUT230

OUT231

OUT232

OUT233

OUT234

OUT235

OUT236

OUT237

OUT238

OUT239

OUT240

OUT241

OUT242

OUT243

OUT244

OUT245

OUT246

OUT247

OUT248

OUT249

OUT250

OUT251

OUT252

OUT253

OUT254

OUT255

OUT256

OUT257

OUT258

OUT259

OUT260

OUT261

OUT262

OUT263

OUT264

OUT265

OUT266

OUT267

OUT268

OUT269

OUT270

OUT271

OUT272

OUT273

OUT274

OUT275

OUT276

OUT277

OUT278

OUT279

OUT280

OUT281

OUT282

OUT283

OUT284

OUT285

OUT286

OUT287

OUT288

OUT289

OUT290

OUT291

OUT292

OUT293

OUT294

OUT295

OUT296

OUT297

OUT298

OUT299

OUT300

OUT301

OUT302

OUT303

OUT304

OUT305

OUT306

OUT307

OUT308

OUT309

OUT310

OUT311

OUT312

OUT313

OUT314

OUT315

OUT316

OUT317

OUT318

OUT319

OUT320

OUT321

OUT322

OUT323

OUT324

OUT325

OUT326

OUT327

OUT328

OUT329

OUT330

OUT331

OUT332

OUT333

OUT334

OUT335

OUT336

OUT337

OUT338

OUT339

OUT340

OUT341

OUT342

OUT343

OUT344

OUT345

OUT346

OUT347

OUT348

OUT349

OUT350

OUT351

OUT352

OUT353

OUT354

OUT355

OUT356

OUT357

OUT358

OUT359

OUT360

OUT361

OUT362

OUT363

OUT364

OUT365

OUT366

OUT367

OUT368

OUT369

OUT370

OUT371

OUT372

OUT373

OUT374

OUT375

OUT376

OUT377

OUT378

OUT379

OUT380

OUT381

OUT382

OUT383

OUT384

OUT385

OUT386

OUT387

OUT388

OUT389

OUT390

OUT391

OUT392

OUT393

OUT394

OUT395

OUT396

OUT397

OUT398

OUT399

OUT400

OUT401

OUT402

OUT403

OUT404

OUT405

OUT406

OUT407

OUT408

OUT409

OUT410

OUT411

OUT412

OUT413

OUT414

OUT415

OUT416

OUT417

OUT418

OUT419

OUT420

OUT421

OUT422

OUT423

OUT424

OUT425

OUT426

OUT427

OUT428

OUT429

OUT430

OUT431

OUT432

OUT433

OUT434

OUT435

OUT436

OUT437

OUT438

OUT439

OUT440

OUT441

OUT442

OUT443

OUT444

OUT445

OUT446

OUT447

OUT448

OUT449

OUT450

OUT451

OUT452

OUT453

OUT454

OUT455

OUT456

OUT457

OUT458

OUT459

OUT460

OUT461

OUT462

OUT463

OUT464

OUT465

OUT466

OUT467

OUT468

OUT469

OUT470

OUT471

OUT472

OUT473

OUT474

OUT475

OUT476

OUT477

OUT478

OUT479

OUT480

OUT481

OUT482

OUT483

OUT484

OUT485

OUT486

OUT487

OUT488

OUT489

OUT490

OUT491

OUT492

OUT493

OUT494

OUT495

OUT496

OUT497

OUT498

OUT499

OUT500

OUT501

OUT502

OUT503

OUT504

OUT505

OUT506

OUT507

OUT508

OUT509

OUT510

OUT511

OUT512

OUT513

OUT514

OUT515

OUT516

OUT517

OUT518

OUT519

OUT520

OUT521

OUT522

OUT523

OUT524

OUT525

OUT526

OUT527

OUT528

OUT529

OUT530

OUT531

OUT532

OUT533

OUT534

OUT535

OUT536

OUT537

OUT538

OUT539

OUT540

OUT541

OUT542

OUT543

OUT544

OUT545

OUT546

OUT547

OUT548

OUT549

OUT550

OUT551

OUT552

OUT553

OUT554

OUT555

OUT556

OUT557

OUT558

OUT559

OUT560

OUT561

OUT562

OUT563

OUT564

OUT565

OUT566

OUT567

OUT568

OUT569

OUT570

OUT571

OUT572

OUT573

OUT574

OUT575

OUT576

OUT577

OUT578

OUT579

OUT580

OUT581

OUT582

OUT583

OUT584

OUT585

OUT586

OUT587

OUT588

OUT589

OUT590

OUT591

OUT592

OUT593

OUT594

OUT595

OUT596

OUT597

OUT598

OUT599

OUT600

OUT601

OUT602

OUT603

OUT604

OUT605

OUT606

OUT607

OUT608

OUT609

OUT610

OUT611

OUT612

OUT613

OUT614

OUT615

OUT616

OUT617

OUT618

OUT619

OUT620

OUT621

OUT622

OUT623

OUT624

OUT625

OUT626

OUT627

OUT628

OUT629

OUT630

OUT631

OUT632

OUT633

OUT634

OUT635

OUT636

OUT637

OUT638

OUT639

OUT640

OUT641

OUT642

OUT643

OUT644

OUT645

OUT646

OUT647

OUT648

OUT649

OUT650

OUT651

OUT652

OUT653

OUT654

OUT655

OUT656

OUT657

OUT658

OUT659

OUT660

OUT661

OUT662

OUT663

OUT664

OUT665

OUT666

OUT667

OUT668

OUT669

OUT670

OUT671

OUT672

OUT673

OUT674

OUT675

OUT676

OUT677

OUT678

OUT679

OUT680

OUT681

OUT682

OUT683

OUT684

OUT685

OUT686

OUT687

OUT688

OUT689

OUT690

OUT691

OUT692

OUT693

OUT694

OUT695

OUT696

OUT697

OUT698

OUT699

OUT700

OUT701

OUT702

OUT703

OUT704

OUT705

OUT706

OUT707

OUT708

OUT709

OUT710

OUT711

OUT712

OUT713

OUT714

OUT715

OUT716

OUT717

OUT718

OUT719

OUT720

OUT721

OUT722

OUT723

OUT724

OUT725

OUT726

OUT727

OUT728

OUT729

OUT730

OUT731

OUT732

OUT733

OUT734

OUT735

OUT736

OUT737

OUT738

OUT739

OUT740

OUT741

OUT742

OUT743

OUT744

OUT745

OUT746

OUT747

OUT748

OUT749

OUT750

OUT751

OUT752

OUT753

OUT754

OUT755

OUT756

OUT757

OUT758

OUT759

OUT760

OUT761

OUT762

OUT763

OUT764

OUT765

OUT766

OUT767

OUT768

OUT769

OUT770

OUT771

OUT772

OUT773

OUT774

OUT775

OUT776

OUT777

OUT778

OUT779

OUT780

OUT781

OUT782

OUT783

OUT784

OUT785

OUT786

OUT787

OUT788

OUT789

OUT790

OUT791

OUT792

OUT793

OUT794

OUT795

OUT796

OUT797

OUT798

OUT799

OUT800

OUT801

OUT802

OUT803

OUT804

OUT805

OUT806

OUT807

OUT808

OUT809

OUT810

OUT811

OUT812

OUT813

OUT814

OUT815

OUT816

OUT817

OUT818

OUT819

OUT820

OUT821

OUT822

OUT823

OUT824

OUT825

OUT826

OUT827

OUT828

OUT829

OUT830

OUT831

OUT832

OUT833

OUT834

OUT835

OUT836

OUT837

OUT838

OUT839

OUT840

OUT841

OUT842

OUT843

OUT844

OUT845

OUT846

OUT847

OUT848

OUT849

OUT850

OUT851

OUT852

OUT853

OUT854

OUT855

OUT856

OUT857

OUT858

OUT859

OUT860

OUT861

OUT862

OUT863

OUT864

OUT865

OUT866

OUT867

OUT868

OUT869

OUT870

OUT871

OUT872

OUT873

OUT874

OUT875

OUT876

OUT877

OUT878

OUT879

OUT880

OUT881

OUT882

OUT883

OUT884

OUT885

OUT886

OUT887

OUT888

OUT889

OUT890

OUT891

OUT892

OUT893

OUT894

OUT895

OUT896

OUT897

OUT898

OUT899

OUT900

OUT901

OUT902

OUT903

OUT904

OUT905

OUT906

OUT907

OUT908

OUT909

OUT910

OUT911

OUT912

OUT913

OUT914

OUT915

OUT916

OUT917

OUT918

OUT919

OUT920

OUT921

OUT922

OUT923

OUT924

OUT925

OUT926

OUT927

OUT928

OUT929

OUT930

OUT931

OUT932

OUT933

OUT934

OUT935

OUT936

OUT937

OUT938

OUT939

OUT940

OUT941

OUT942

OUT943

OUT944

OUT945

OUT946

OUT947

OUT948

OUT949

OUT950

OUT951

OUT952

OUT953

OUT954

OUT955

OUT956

OUT957

OUT958

OUT959

OUT960

OUT961

OUT962

OUT963

OUT964

OUT965

OUT966

OUT967

OUT968

OUT969

OUT970

OUT971

OUT972

OUT973

OUT974

OUT975

OUT976

OUT977

OUT978

OUT979

OUT980

OUT981

OUT982

OUT983

OUT984

OUT985

OUT986

OUT987

OUT988

OUT989

OUT990

OUT991

OUT992

OUT993

OUT994

OUT995

OUT996

OUT997

OUT998

OUT999

OUT1000

OUT1001

OUT1002

OUT1003

OUT1004

OUT1005

OUT1006

OUT1007

OUT1008

OUT1009

OUT1010

OUT1011

OUT1012

OUT1013

OUT1014

OUT1015

OUT1016

OUT1017

OUT1018

OUT1019

OUT1020

OUT1021

OUT1022

OUT1023

OUT1024

OUT1025

OUT1026

OUT1027

OUT1028

OUT1029

OUT1030

OUT1031

OUT1032

OUT1033

OUT1034

OUT1035

OUT1036

OUT1037

OUT1038

OUT1039

OUT1040

OUT1041

OUT1042

OUT1043

OUT1044

OUT1045

OUT1046

OUT1047

OUT1048

OUT1049

OUT1050

OUT1051

OUT1052

OUT1053

OUT1054

OUT1055

OUT1056

OUT1057

OUT1058

OUT1059

OUT1060

OUT1061

OUT1062

OUT1063

OUT1064

OUT1065

OUT1066

OUT1067

OUT1068

OUT1069

OUT1070

OUT1071

OUT1072

OUT1073

OUT1074

OUT1075

OUT1076

OUT1077

OUT1078

OUT1079

OUT1080

OUT1081

OUT1082

OUT1083

OUT1084

OUT1085

OUT1086

OUT1087

OUT1088

OUT1089

OUT1090

OUT1091

OUT1092

OUT1093

OUT1094

OUT1095

OUT1096

OUT1097

OUT1098

OUT1099

OUT1100

OUT1101

OUT1102

OUT1103

OUT1104

OUT1105

OUT1106

OUT1107

OUT1108

OUT1109

OUT1110

OUT1111

OUT1112

OUT1113

OUT1114

OUT1115

OUT1116

OUT1117

OUT1118

OUT1119

OUT1120

OUT1121

OUT1122

OUT1123

OUT1124

OUT1125

OUT1126

OUT1127

OUT1128

OUT1129

OUT1130

OUT1131

OUT1132

OUT1133

OUT1134

OUT1135

OUT1136

OUT1137

OUT1138

OUT1139

OUT1140

OUT1141

OUT1142

OUT1143

OUT1144

OUT1145

OUT1146

OUT1147

OUT1148

OUT1149

OUT1150

OUT1151

OUT1152

OUT1153

OUT1154

OUT1155

OUT1156

OUT1157

OUT1158

OUT1159

OUT1160

OUT1161

OUT1162

OUT1163

OUT1164

OUT1165

OUT1166

OUT1167

OUT1168

OUT1169

OUT1170

OUT1171

OUT1172

OUT1173

OUT1174

OUT1175

OUT1176

OUT1177

OUT1178

OUT1179

OUT1180

OUT1181

OUT1182

OUT1183

OUT1184

OUT1185

OUT1186

OUT1187

OUT1188

OUT1189

OUT1190

OUT1191

OUT1192

OUT1193

OUT1194

OUT1195

OUT1196

OUT1197

OUT1198

OUT1199

OUT1200

OUT1201

OUT1202

OUT1203

OUT1204

OUT1205

OUT1206

OUT1207

OUT1208

OUT1209

OUT1210

OUT1211

OUT1212

OUT1213

OUT1214

OUT1215

OUT1216

OUT1217

OUT1218

OUT1219

OUT1220

OUT1221

OUT1222

OUT1223

OUT1224

OUT1225

OUT1226

OUT1227

OUT1228

OUT1229

OUT1230

OUT1231

OUT1232

OUT1233

OUT1234

OUT1235

OUT1236

OUT1237

OUT1238

OUT1239

OUT1240

OUT1241

OUT1242

OUT1243

OUT1244

OUT1245

OUT1246

OUT1247

OUT1248

OUT1249

OUT1250

OUT1251

OUT1252

OUT1253

OUT1254

OUT1255

OUT1256

OUT1257

OUT1258

OUT1259

OUT1260

OUT1261

OUT1262

OUT1263

OUT1264

OUT1265

OUT1266

OUT1267

OUT1268

OUT1269

OUT1270

OUT1271

OUT1272

OUT1273

OUT1274

OUT1275

OUT1276

OUT1277

OUT1278

OUT1279

OUT1280

OUT1281

OUT1282

OUT1283

OUT1284

OUT1285

OUT1286

OUT1287

OUT1288

OUT1289

OUT1290

OUT1291

OUT1292

OUT1293

OUT1294

OUT1295

OUT1296

OUT1297

OUT1298

OUT1299

OUT1300

OUT1301

OUT1302

OUT1303

OUT1304

OUT1305

OUT1306

OUT1307

OUT1308

OUT1309

OUT1310

OUT1311

OUT1312

OUT1313

OUT1314

OUT1315

OUT1316

OUT1317

OUT1318

OUT1319

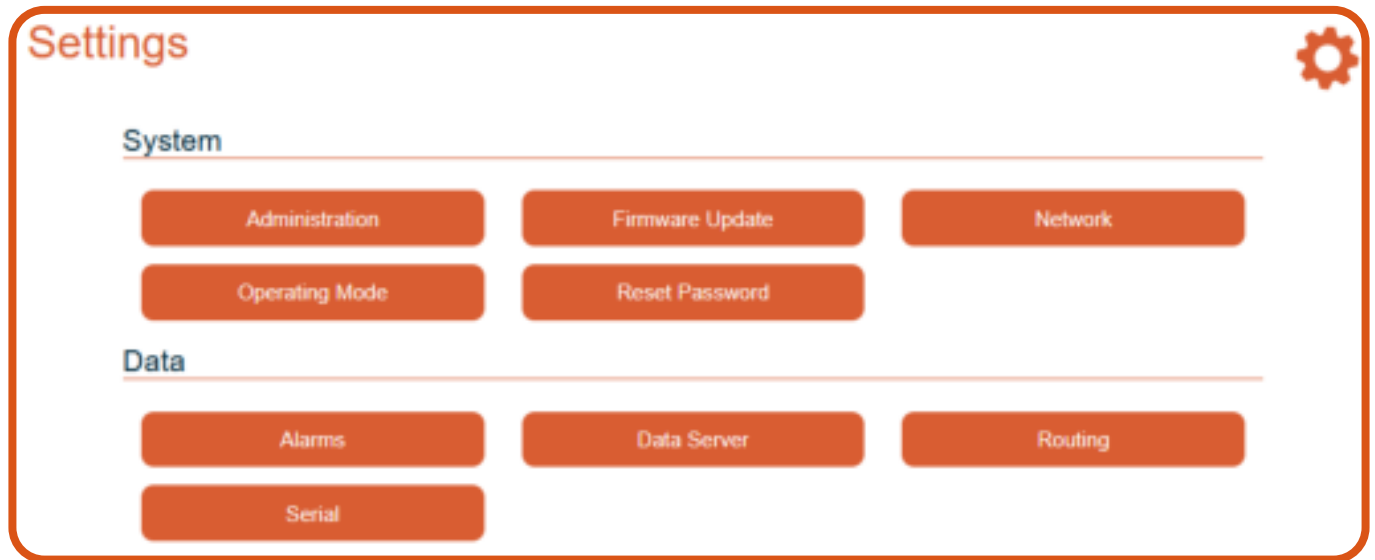
OUT1320

OUT132

Settings Icon



- Provides access to the device for configuration.
- Using any of these setting requires that the user 'Login' to the device (see page 5).
- The settings page provides the following functionality:



Administration:

Facility to change password only (Username is always 'admin')
Facility to re-start device.

Firmware Update:

Details current firmware version and provides the facility to update.

Network:

Allows the network to be configured correctly depending upon your particular set-up.

Operating mode:

Allows any pre-configured modes to be selected.

Reset Password:

Password can be reset to factory default

Alarms:

Allows the user to set up any required alarms.

Data Server:

Provides facility to turn server on/off as well as specifying data format output, direction and output protocol.

Routing:

Main configuration table to allow precise routing of data between inputs and outputs.
Access to 'autoswitch' operation and set-up.

Serial:

Allows full configuration for each port including baud rate setting, data direction, an 'alias' naming facility and also shows the current data load on each port.

Planning your NMEA0183 network

- Your PRO range device allows you to input data from NMEA0183 talkers' and direct these signals either individually, or in combination with other signals, to the various output ports which the device provides (See page 4 for details on individual number of ports available of the PRO range).
- In order for this to work correctly, the device must know at what baud rate the connected device is running. It is helpful to be able to name each device separately, so a facility to do this is provided.

Configuring Input from 'Talkers'

- Please read this section in conjunction with the install/user manual if unsure of the required steps
- Adding an 0183 'talker' device is a straight forward process.
- Connect your NMEA 0183 'talker' to one of the 'Listener' ports on the PRO product.
- Pay attention to the wire-colours if your device follows the NMEA 0183 standard.
- **Connect the 'talker' pair of wires from your 0183 device to your PRO device "listener" port.**
- Configure the device from within 'Serial Settings' of the configuration tool.
- Give the device a useful/meaningful name for future reference by filling in the blank 'Name' box next to its input.

As an example, shown below, we have installed an AIS unit/two GPS units and a Speed sensor to the first four inputs of a PRO-MUX-2.

We have set the baud rate (speed) of the AIS unit to 38400, which is the usual rate for an AIS unit. The remaining three devices have all been set to 4800 baud.

NOTE: The first four inputs of the PRO-MUX-2 can be set to 'auto-baud' between 4800 & 38400 if required. Auto-baud allows the PRO-MUX-2 to follow the baud rate of the connected talker, without the need to specify it. This is helpful if you are unsure of the 'talker' baud rate, or it can change during its normal operation. Inputs 5-8 are pre-set to 4800 baud only. Again, the number of inputs and outputs visible will depend on the product being configured. Auto-baud is a feature implemented on all PRO-range products.



Serial Settings

Interface	Name	Mode ⓘ	Speed	Direction ⓘ
SERIAL			115200	↔
IN1	AIS	☐ Manual	38400	←
IN2	GPS #1	☐ Manual	4800	←
IN3	GPS #2	☐ Manual	4800	←
IN4	Speed	☐ Manual	4800	←

Configuring Output to 'Listeners'

- Configuring outputs from the PRO device is performed in a similar way to configuring inputs.
- Please read this section in conjunction with the install/user manual if unsure of the required steps
- Pay attention to the wire-colours if your device follows the NMEA 0183 standard.
- **Connect the 'talker' pair of wires from your PRO device to your NMEA 0183 "listener" port.**
- Configure the device from within the 'Serial Settings' of the configuration tool.
- Give the output stream a useful/meaningful name for future reference as shown previously.

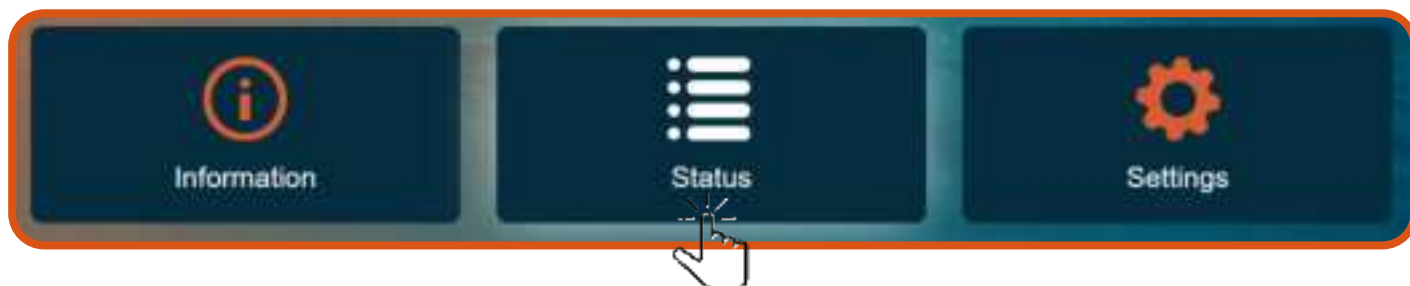
As an example below, we have installed an NGW-1-ISO, a Radar and an Autopilot to the first three outputs of a PRO-MUX-2.

We have set the baud rate (speed) of the NGW-1-ISO unit to 38400 baud. The remaining devices have been set to 4800.

Consult the manuals and datasheets for your individual devices to find the correct settings.

Serial Settings				
Interface	Name	Mode ⓘ	Speed	Direction ⓘ
IN7			4800	←
IN8			4800	←
OUT1	NGW-1-ISO	>	38400	→
OUT2	Radar	>	4800	→
OUT3	Autopilot	>	4800	→

To confirm any changes made to the INPUTS and OUTPUTS on the device, click on the Serial tab of the 'Status' page.



The setting made above will result in the following page being displayed (p.13)

Serial 'Status' confirmation

- Below is the current state of INPUTS and OUTPUTS based on the previous examples.
- With real devices connected and 'talking' to the network, there would be an indication of 'Load' displayed as well.

Data Servers							
Serial							
Detailed State							
Routing							
Alarms							
Interface	Name	Mode	Speed	Direction	Load		
SERIAL			115200	↔	0%		+
IN1	AS	Manual	4800	←	0%		+
IN2	GPS #1	Manual	4800	←	0%		+
IN3	GPS #2	Manual	4800	←	0%		+
IN4	Speed	Manual	4800	←	0%		+
IN5			4800	←	0%		+
IN6			4800	←	0%		+
IN7			4800	←	0%		+
IN8			4800	←	0%		+
OUT1	NGW-1-ISO	>	38400	→	0%		+
OUT2	Radar	>	4800	→	0%		+
OUT3	Autopilot	>	4800	→	0%		+
OUT4		>	4800	→	0%		+
OUT5		>	4800	→	0%		+
OUT6		>	4800	→	0%		+
DS1				↔	0%		+

Load Indicator

- Once the device is operational and combining data, each port in use will give an indication of its current 'load' and sentences being passed as shown below.

Serial Settings							
Interface	Name	Mode	Speed	Direction	Load		
SERIAL			115200	↔	0%		+
IN1	GPS	Auto	4800	←	62%		-

← GPDTM(0) GPDGA(10) GPOLL(10) GPSMA(10) GPSMA(0) GRMVC(0) GRVTC(10) GRZDA(0)

Routing of INPUTS to OUTPUTS

- Once the required 'talkers and 'listeners' are connected to the device, you need to decide how you wish the various input signals to be routed and/or combined to the required outputs.
- When implementing this routing plan, there are baud rate issues that need to be considered.
- An input signal being received at 4800 baud will not be output 4x faster if the **output** baud rate is set to 38400 baud. The device cannot replicate the messages it receives. The input signal of 4800 baud **can** be output at 38400 baud, but not repeated any faster than the original 4800 input baud rate frequency.
- An input signal being received at 38400 baud will result in a loss of data if it is tied to an output baud rate rate lower than the input. If the rate of messages being received is faster than the output port can transmit them, this will lead to signal loss, and sentences being dropped. This is quite a common scenario and is not necessarily an issue if its implications are understood.

The Routing Matrix (see page 15 for details of routing settings)

Shown below is an indication of the routing matrix which will be observed on the device.

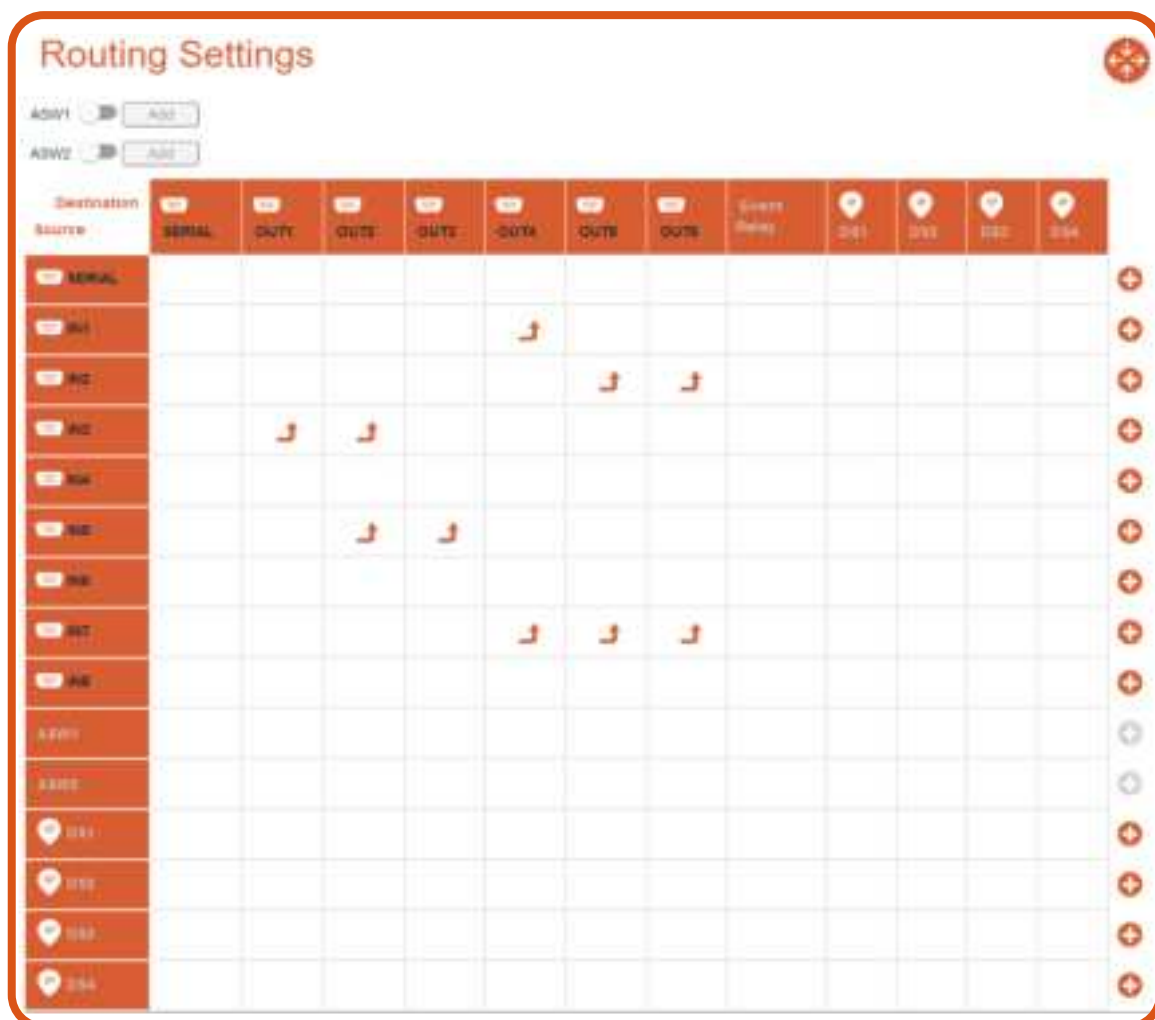
- This screen shot shows the settings for a PRO-MUX-2 for example only.
- The inputs for the PRO-MUX-2 are located on the LHS of the matrix table.
- The outputs from the PRO-MUX-2 are shown on the horizontal orange bar.
- DS1(IP) input/output relates to the Ethernet port.
- ASW1 & ASW-2 provide access to the auto-switching functionality. These are inactive when auto-switching is not being used.

The screenshot displays the 'Routing Settings' window. At the top, there are two toggle switches for 'ASW1' and 'ASW2', both currently set to 'OFF'. Below these is a 'Destination' dropdown menu set to 'Source'. The main area is a routing matrix table. The columns are labeled 'SERIAL', 'OUT1', 'OUT2', 'OUT3', 'OUT4', 'OUT5', 'OUT6', 'OUT7', 'OUT8', 'Event', 'DS1', 'DS2', 'DS3', and 'DS4'. The rows are labeled on the left with 'SERIAL', 'IN1', 'IN2', 'IN3', 'IN4', 'IN5', 'IN6', 'IN7', 'IN8', 'ASW1', 'ASW2', 'DS1', 'DS2', 'DS3', and 'DS4'. Each cell in the matrix contains a small icon representing a connection type. To the right of the matrix, there is a vertical column of red circular buttons with white plus signs, likely for adding or removing connections.

Basic Routing

- The basic routing of signals is a straight forward process of connecting inputs and outputs in the matrix table.
- Inputs and outputs are connected by setting or clearing the point where they cross in the table.
- As an example setting (shown below) the following routing connections have been made.
- OUT-6 - Taking a feed from IN-2 and IN-7
- OUT-5 - Taking a feed from IN-2 and IN-7
- OUT-4 - Taking a feed from IN-1 and IN-7
- OUT-3 - Taking a feed from IN-5 only
- OUT-2 - Taking a feed from IN-3 and IN-5
- OUT-1 - taking a feed from IN-3 only

From your browser window, simply click the box where you wish a connection between input and output to be made and an orange arrow will indicate that this IN-OUT connection has been implemented. To disable the routing between and input & output, simply click the arrow again, and the connection will be removed.



Advanced Routing

- Advanced routing is a feature which allows the user to select which messages within an 0183 data stream are allowed to pass to the output and which sentences are not transmitted.
- It is an ideal feature if you only require certain sentences transmitted and helps to improve the message bandwidth.
- As an example of how this feature works, we have set up a feed from IN-1 to OUT-1 with a data stream containing 5 different 0183 sentences.
- These sentences contain GPGGA, GPGSA, GPGSV, PGVTG & GPZDA.
- On feeding this data into IN-1 and out from OUT-1 the following message stream would be available.

```

$GPVTG,1.1,M,0.05,N,0.09,K,H*2F
$GPGSA,A,3,11,14,19,20,23,28,31,32,,,,,1.6,1.0,1.2*30
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,2,09,20,55,254,48,23,16,188,44,28,15,270,27,31,07,095,40*78
$GPGSV,3,2,09,20,55,254,48,23,16,188,44,28,15,270,27,31,07,095,40*78
$GPGSV,3,3,09,32,84,338,50,,,,,,,,,,,,,*40
$GPGSV,3,3,09,32,84,338,50,,,,,,,,,,,,,*40
$GPZDA,080453.00,08,04,2010,-2.00*7C
$GPGGA,080453.31,4329.771,N,00521.115,E,1,08,1.0,115.29,M,49.16,M,,*67
$GPVTG,1.1,M,0.04,N,0.08,K,A*2F
$GPGSA,A,3,11,14,19,20,23,28,31,32,,,,,1.6,1.0,1.2*30
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D

```

- On viewing the Routing Settings page, shown below, clicking on the '+' sign at the RHS in the "Advanced" column will display all of the message headers that this stream contains.

Routing Settings

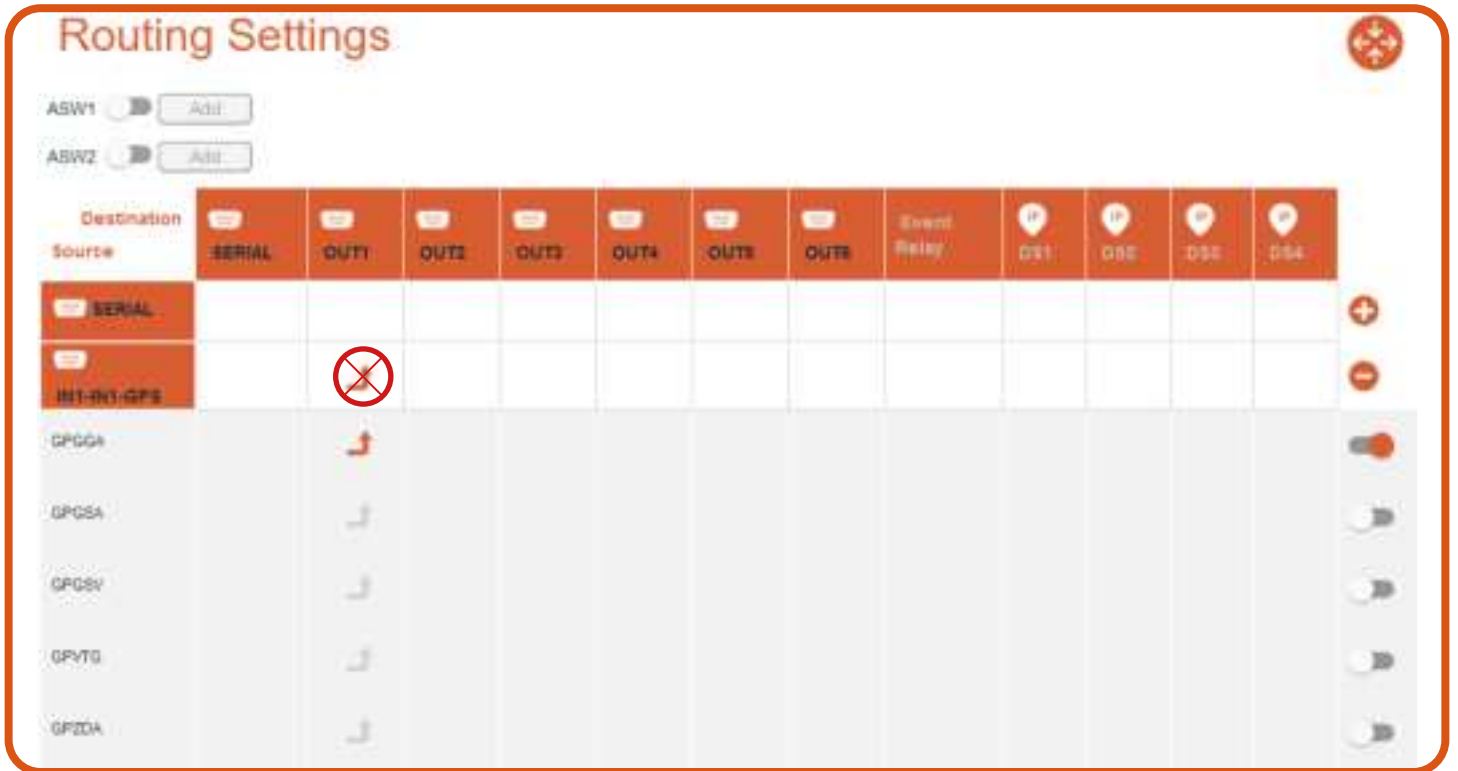
ASW1 ☐ Add

ASW2 ☐ Add

Destination	SERIAL	OUT1	OUT2	OUT3	OUT4	OUT5	OUT6	Client delay	Q11	Q12	Q13	Q14
SERIAL												
IN1-IN1-GPS												
GPGGA												
GPGSA												
GPGSV												
PGVTG												
GPZDA												

Advanced Routing (cont'd)

- If you wish, for example, to only allow sentence GPGGA to pass through to OUT-1, you need to perform the following three steps:
- 1: Enable the required message with the slider on the RHS (in this case GPGGA).
 - 2: **Disable the IN-1 to OUT-1 FULL data stream. This stops the entire stream being transmitted.** 
 - 3: Enable the required message stream from within the header window (Tick beside GPGGA only).



- The setting shown above will automatically transmit GPGGA, and reject all other sentences from this data stream (as shown below). There is a small delay as buffers are emptied.
- You are free to select other sentences for transmission, or by selecting all but one sentence, you can reject an individual sentence if required.
- As shown below, only the GPGGA sentence is now being transmitted.

```

$GPGSV,3,3,09,32.84,338.50,,,,,,,,,,,,,*40
$GPGSV,3,3,09,32.84,338.50,,,,,,,,,,,,,*40
$GPGGA,080454.31,4329.771,N,00521.114,E,1,08,1.0,115.02,M,49.16,M,,*68
$GPGGA,080454.31,4329.771,N,00521.114,E,1,08,1.0,115.02,M,49.16,M,,*68
$GPGGA,080454.31,4329.771,N,00521.114,E,1,08,1.0,115.02,M,49.16,M,,*68
$GPGGA,080454.31,4329.771,N,00521.114,E,1,08,1.0,115.02,M,49.16,M,,*68
$GPGGA,080454.31,4329.771,N,00521.114,E,1,08,1.0,115.02,M,49.16,M,,*68
$GPGGA,080454.31,4329.771,N,00521.114,E,1,08,1.0,115.02,M,49.16,M,,*68
$GPGGA,080455.31,4329.771,N,00521.115,E,1,08,1.0,115.19,M,49.16,M,,*62
$GPGGA,080455.31,4329.771,N,00521.115,E,1,08,1.0,115.19,M,49.16,M,,*62
$GPGGA,080455.31,4329.771,N,00521.115,E,1,08,1.0,115.19,M,49.16,M,,*62
$GPGGA,080455.31,4329.771,N,00521.115,E,1,08,1.0,115.19,M,49.16,M,,*62
$GPGGA,080456.31,4329.771,N,00521.115,E,1,08,1.0,115.15,M,49.16,M,,*6D
$GPGGA,080456.31,4329.771,N,00521.115,E,1,08,1.0,115.15,M,49.16,M,,*6D
$GPGGA,080456.31,4329.771,N,00521.115,E,1,08,1.0,115.15,M,49.16,M,,*6D
$GPGGA,080456.31,4329.771,N,00521.115,E,1,08,1.0,115.15,M,49.16,M,,*6D

```

Alarm Connections (PRO-BUF-2 & PRO-MUX-2) (See the user/install manual)

The PRO-range products feature alarm functionality which, depending on the condition being monitored, can output NMEA 0183 messages to display equipment / MFD's etc.

Currently, the PRO-range caters for three alarm conditions:

- Autoswitch: Gives warning that an autoswitch occurrence has occurred.
- Data Overload: Alerts the user that data overload has occurred on a port
- Low voltage: Reports the status of the battery voltage.

Alarm Relay

PRO-range products feature an alarm relay (Excludes PRO-NDC-1E & 1E2K) to allow electrical connections to be made to the device to trigger visual and/or audible signals. This will alert the user that an alarm condition has been met. The installed relay has the usual COM(Common), NC(Normally closed) & NO(Normally open) configuration.

PLEASE NOTE: As written on the label of the device, the NC & NO legend refers to the de-energized state of the relay. i.e. The "powered off"/ "power lost" state. When the device first receives power, you will hear a click as the relay energizes so that a "power lost" state can be detected by any alarm monitoring circuit. This implies that if you are connecting to a system which is monitoring a closed loop, then the COM and NO connections should be used so that the "power lost" state can be detected. Power loss is not an alarm event which can be sent as an 0183 sentence.

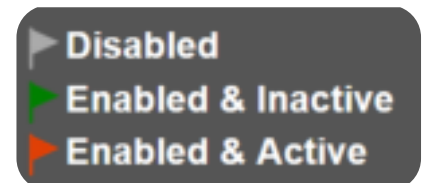
Setting the Alarm

The alarm has its own configuration menu accessed via the "Settings" page.

Below we explain the process for setting up the "low voltage" alarm.

There are three conditions that can be set with the "flag" icon.

- Output solely NMEA 1083 sentences
- Activate the relay separately.
- Activate both alarms together.



Event	Re-Arm	Action	State
Low Voltage: 11V	Time: 1min	NMEA0183 Message: Repeat 1s	State: Enabled & Inactive
Sends NMEA 0183 Message Example: \$WDLR,00,001.003,PRO118Voltage,Alert,PWR,10.2V Count: 0			
Set Relay			

- **Event:** Select the event you wish to monitor for. Here, we are setting the battery "low-voltage" alarm. Should it drop below 11v, the alarm will be triggered.
- **Re-Arm:** The length of time you wish to elapse before the alarm is re-armed.
- **Action:** This allows you to set the frequency of outputted messages. Uncheck "repeat" to allow a single message only.
- To Activate the alarm simply click the "flag" icon in whichever position you require and this will change it's colour from grey to green to indicate that the alarm is "enabled & inactive". Should the alarm be activated, the flag will change colour to red to indicate an "enabled & active" status.
- The "+" icon on the RHS gives access to an running alarm count.
- To select which port you wish this alarm signal to be fed to, simply select the required output port in the small routing matrix at the bottom of the alarms window.

Troubleshooting Guide

First level PRO range diagnostics/fault finding can be performed by observing the LED behaviour. Please consult the user/install manual for your own device for details regarding LED behaviour.

In addition to the above, please always check the following points.

- Connectors are fully inserted
- All pins of the connector are in the correct location (not overlapping into another port position)
- Wires are terminated firmly and correctly (check polarity)



Active Research Ltd
21 Harwell Road
Poole, Dorset
UK BH17 0GE

Telephone: +44 (0)1202 746682
Email: sales@actisense.com
Web: www.actisense.com