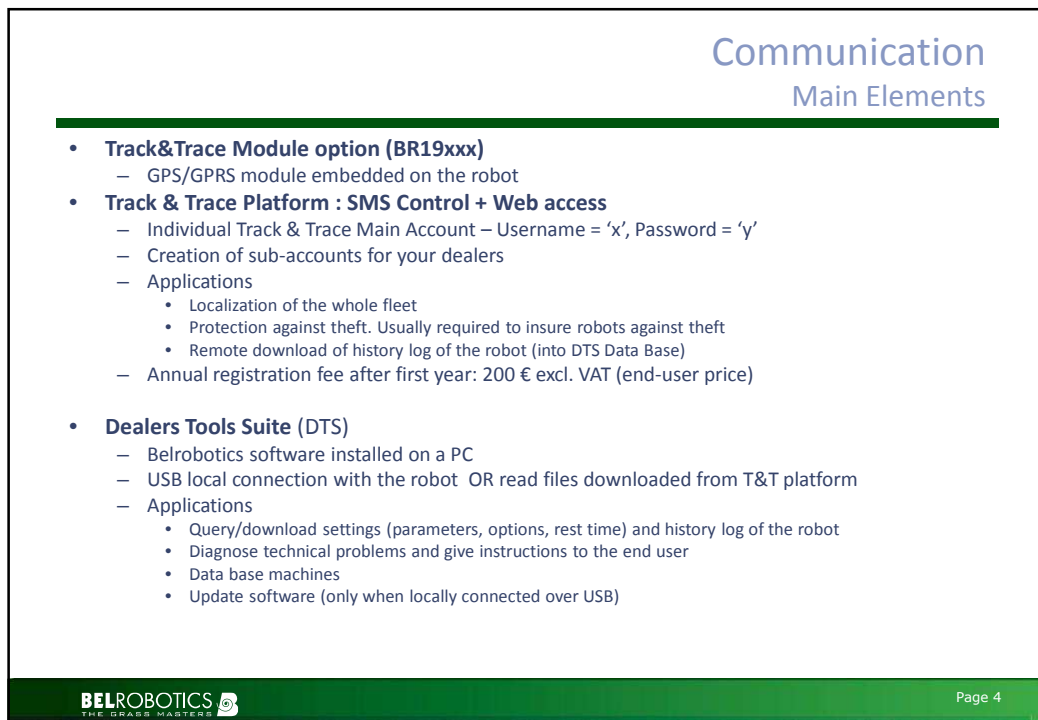
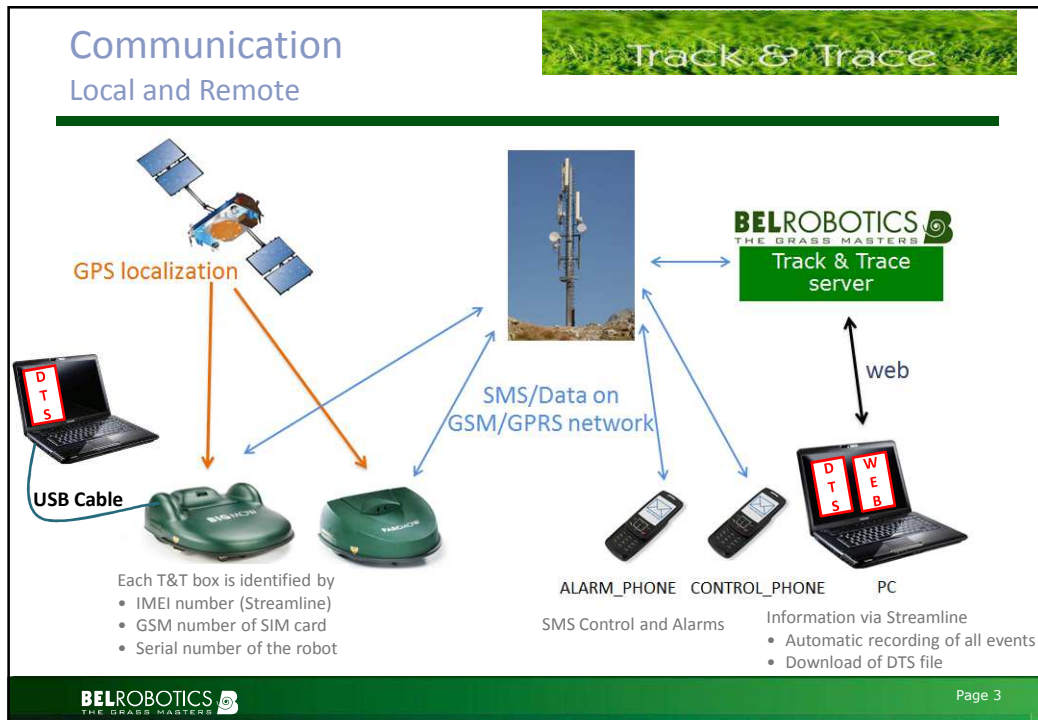




Belrobotics Leader in the automatic maintenance of large grounds	
1	Local and remote communication + New in 2013
2	Dealers Tool Suite (DTS)
3	Track & Trace (T&T) SW and SMS Messages
4	Streamline T&T Server

BELROBOTICS
THE GRASS MASTERS

Page 2

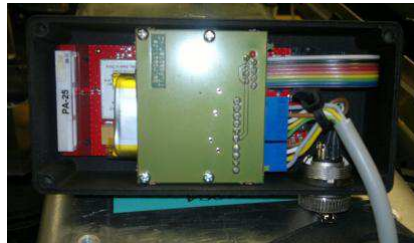


Communication 2013 HW

- Track&Trace Compact Module + Easy Access USB Interface



BigMow



ParcMow



GreenMow

T&T Compact Module 2013 What to do if problem?

- First, contact Belrobotics After Sales Support
- If T&T HW module (BR19193) needs to be replaced...
 - **!!!! NEVER connect/disconnect new T&T Module with robot powered ON to avoid damaging mainboard**
 - DO NOT OPEN the HW Module (Blackbox)
 - Take it out from the machine (unscrew)
 - Disconnect it
 - Send it back to After Sales
 - Install the complete black box as an entity



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2	Dealers Tool Suite (DTS)

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Page 7

DTS

DTS
Functionality

- DTS Functionality
 - Belrobotics software installed on a PC (Min. configuration: Windows XP, Screen definition 1024 x 720)
 - Import history logs from local USB connection with the robot or from files downloaded on T&T platform
 - Maintain a database of robots logs
 - Applications
 - Diagnose technical problems and give instructions to the end user
 - Update software (only when locally connected over USB)

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Page 8



DTS

DTS

Recent Releases

- Release 4.14 (available on extranet)
 - Improved COM port detection (local USB)
 - Automatic history download before FW upgrade (local USB)
 - Correct time stamp of the DTS logs downloaded from T&T server
 - Update for latest 2012 FW
- Release 5.1 (soon on extranet)
 - Update for 2013 FW : multizone parameters, options
 - New presentation look
 - Highlighting of modified system parameters (based on more info embedded in DTS logs)

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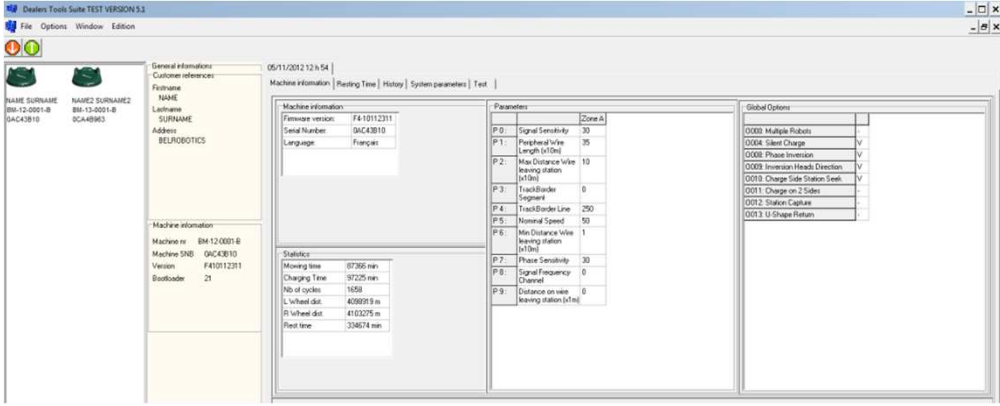
Page 9



DTS

DTS 6.x

New Look



The screenshot displays the DTS 6.x software interface, titled 'Desktop Tools Suite TEST VERSION 5.1'. The interface is divided into several sections:

- General information:** Includes fields for NAME, SURNAME, and ADDRESS.
- Machine information:** Displays details for a specific machine, including its name, version, and statistics.
- Parameters:** A table listing various parameters and their values.
- Global Options:** A list of options that can be configured.

Machine information details:

Field	Value
Machine name	BM 12 0001 B
Machine SN	0K43B10
Version	F410112311
Build date	21

Statistics:

Field	Value
Working time	107255 min
Charging time	107225 min
Nb of cycles	1658
L wheel dist	408097.9 m
R wheel dist	410327.5 m
Rest time	334674 min

Parameters:

Parameter	Value
P0: Signal Sensitivity	30
P1: Peripheral wire Length (x10m)	35
P2: Max Distance Valve leaving station (x10m)	10
P3: Track/Blade Segment	0
P4: Track/Blade Line	250
P5: Nominal Speed	50
P6: Max Distance Valve leaving station (x10m)	1
P7: Phase Sensitivity	30
P8: Signal Frequency Channel	0
P9: Distance on wire leaving station (x10m)	0

Global Options:

Option	Value
0000: Multiple Robots	
0004: Silent Charge	V
0008: Phase Inversion	V
0009: Inversion Head Direction	V
0010: Charge Side Station Seek	V
0011: Charge on 2 Sides	
0012: Station Capture	
0013: 11 Shape Platform	

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THE GRASS MASTERS

Page 10



DTS

DTS 6.x
New Look

Dealers Tools Suite TEST VERSION 5.1

File Options Window Edition



NAME SURNAME
BM-12-0001-B
DACA3810



NAME2 SURNAME2
BM-13-0001-B
DCA48963

General informations:
Customer references

Firstname
NAME

Lastname
SURNAME

Address
BELROBOTICS

Machine information

Machine nr
BM-12-0001-B

Machine SNB
DACA3810

Version
F410112311

Bootloader
21

05/11/2012 12 h 54

Machine information

Resting Time | History | System parameters | Test

	03	06	09	12	15	18	21
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday							
Sunday							

Stop A



Page 11



DTS

DTS 6.x
MultiZone FW Support

Dealers Tools Suite TEST VERSION 5.1

File Options Window Edition



NAME SURNAME
BM-12-0001-B
DACA3810



NAME2 SURNAME2
BM-13-0001-B
DCA48963

General informations:
Customer references

Firstname
NAME2

Lastname
SURNAME2

Address

Machine information

Machine nr
BM-13-0001-B

Machine SNB
DCA48963

Version
C413022031

Bootloader
22

20/10/2013 17 h 54 | 07/02/2013 17 h 53

Machine information

Resting Time | History | System parameters | Test

Machine information

Firstname version
C413022031

Serial Number
DCA48963

Language
Francais

Statistics

Moving time
1 min

Charging Time
8 min

No of cycles
0

L wheel dist
10 m

R wheel dist
10 m

Rest time
8 min

Parameters

	Zone A	Zone B	Zone C
P0:	Signal Sensitivity	30	30
P1:	Peripherals Vibe	60	60
P2:	Max Distance Vibe	10	10
P3:	Track Border	0	0
P4:	Track Border Line	120	120
P5:	Normal Speed	50	50
P6:	Min Distance Vibe	1	1
P7:	Phase Sensitivity	30	30
P8:	Signal Frequency	0	0
P9:	Distance on noise	3	3
P10:	Work Time Ratio	1	1

Global Options

0000: Multiple Robots

0004: Silent Charge

0008: Phase Inversion

0009: Inversion Heads Direction

0016: Multizones

Zone Depending Options

Zone	A	B	C
0010: Charge Side Station Seek	-	-	-
0011: Charge on 2 Sides	V	V	V
0013: U-Shape Station	V	V	V
0014: Autostop Vibe	-	-	-
0015: Timer Off	-	-	-
0017: Enable Zone	V	-	-



Page 12



DTS

DTS 6.x

MultiZone FW Support



NAME SURNAME
BM-12-0001-B
0CA43B10



NAME2 SURNAME2
BM-13-0001-B
0CA4B963

General informations:

Customer references:

Firstname NAME2
Lastname SURNAME2
Address

Machine information:

Machine nr BM-13-0001-B
Machine SNB 0CA4B963
Version C413022031
Bootloader 22

20/02/2013 17 h 54 07/02/2013 17 h 53

Machine information | Resting Time | History | System parameters | Test

	03	06	09	12	15	18	21
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday							
Sunday							

State 0 State 1 State 2



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THE GRASS MASTERS

Page 13



DTS

DTS History Log

Interpretation

DTS History: Meaning for the version Software from XX111124XX			
Event	ExtraB	FU1	FU2
Start charging	Discharged capacity (%)	Battery T°	Average Cutting Resistance
End charging	Charged capacity (%)	Ambient T°	Battery T° for NiCd / High Cell # - Low Cell # for LFP
Open bonnet	0	Ambient T°	Average Cutting Resistance
Station seeking	Discharged capacity (%)	Battery T°	Average Cutting Resistance for NiCd / High Cell # - Low Cell # for LFP
Alarm	Alarm type	NA	NA
Switch on	0	Ambient T°	Average Cutting Resistance
Switch off	0	Ambient T°	Average Cutting Resistance
Start working	0	Ambient T°	Average Cutting Resistance
Rest onto station	Charged capacity (%) or Discharged capacity if after charge interruption	Rest type	Battery T° for NiCd / High Cell # - Low Cell # for LFP
Software update	0	Revision #1	Revision #2
Unload balls	0	Balls counter - high byte	Balls counter - low byte

Meaning Rest type
2 = T° Battery > 60°C
3 = T° box < 10°C
4 = Option F2 'Rest on charge' activated
5 = Resistance of cutting head lower and homogeneous during last cycle
6 = Rest period programmed
7 = Manual charge

Average Cutting Resistance
Rest onto station < FU2 (89) ≤ work
Time to rest onto station depends on P1

Balls counter
FU1 = 0 and FU2 = 255 --> TOTAL = 0 + 255 = 255 balls
FU1 = 1 and FU2 = 37 --> TOTAL = 256 + 37 = 293 balls

Derived values
Mean current consumption «A» = ((Discharged capacity «ExtB» x Capacity machine «Ah»)/ time «h»
Mean charging current «A» = ((Charged capacity «ExtB» x Capacity machine «Ah» / time «h»)/ 100



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Page 14

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3Track & Trace (T&T) SW and SMS Messages

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Page 15

Track & Trace 2013

Features

✓ Information request & control SMS – User Friendly Commands (see next slide)

- ✓ To obtain status and operating data
- ✓ To remotely take control of operations

✓ Explicit alarm SMS

- Six languages (FR, EN, NL, D, IT, ES)
- Repeated alarms are filtered to avoid unnecessary traffic

✓ Previous T&T HW modules can be updated to new features

- ✓ New firmware can be downloaded remotely into an old T&T module over the Internet
- ✓ Corresponding software must be updated on the robot as well (local USB connection)

MessagesBigMow Mee...Modifier

ID=351777045279971
Head(s) blocked
28/11/12 13:07:11
<http://maps.google.com/maps?q=50.76101,4.59871&pn=0.05636,0.011996&t=k&hl=en>

ID=351777045279971
Supply outage
28/11/12 13:10:52
<http://maps.google.com/maps?q=50.76117,4.59866&pn=0.05636,0.011996&t=k&hl=en>

Message

Envoyer

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Page 16

SW ONLY upgrade

No Need of new HW module

Track & Trace

Update previous T&T modules to new SW features

✓ Overview of procedure (Technical details available at Belrobotics After Sales Team)

✓ Inform Belrobotics After Sales Support upfront of the intention to upgrade and the timing of operations (some operations must ideally be synchronized between you and After Sales)

✓ When agreed with After Sales, you first have to upgrade the Robot SW

- ✓ Make sure you have T&T USB cable
- ✓ Make sure you have DTS 6,x
- ✓ Download the appropriate Robot MainFW version from Belrobotics Extranet
- ✓ Switch Off Robot, Open Main Cover so to access the mainboard
- ✓ Disconnect the T&T module from the mainboard and connect USB cable instead
- ✓ Download new SW into the robot
- ✓ Disconnect USB cable and Reconnect the T&T module !!!!

✓ Ask Belrobotics After Sales to upgrade the T&T module FW

- ✓ Ideally, this operation should be done just after previous steps so 'live' interaction can take place if any problem
- ✓ The robot must be switched ON or the module backup battery must be charged
- ✓ Belrobotics checks remotely if the new T&T module FW is running fine on the module
- ✓ Belrobotics can check communication between robot and module if robot is ON.

✓ Configure the 'AlarmPhone'/'ControlPhone' of the robot (see next slides)

✓ DONE

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THE GRASS MASTERS

Page 17

Track & Trace

2013 T&T SMS Commands

Commands Functionality	List of Related Commands
Configuring 'Track&Trace' phone numbers	AlarmPhone, AlarmPhone2, CtrlPhone, ClearAlarmPhone, ClearAlarmPhone2, ClearCtrlPhone
Obtaining 'Robot' information	Status, Position, MowerData
Controlling 'Robot'	BackHome, Restart TimerOff, TimerOn
Controlling 'Robot' MultiZone	EnableZone X, DisableZone X
Security aspects (anti-theft)	SetFence, NoFence

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THE GRASS MASTERS

Page 18

Track & Trace

Features. List of commands – Single zone applications

Defining authorized users

1. AlarmPhone1&2: defines master mobile phone number authorized
2. CtrlPhone: defines second mobile phone number authorized
3. ClearAlarmPhone1&2: to clear current master mobile phone number
4. ClearCtrlPhone: to clear current second mobile phone number

Obtaining information

1. Status: to review master and second numbers and to obtain robot status
2. Mowerdata: to have robot sending history file to the StreamLine platform
3. Position: to obtain robot's speed and position with link to GoogleMaps

Taking control of robot operation

1. BackHome: equivalent to 'F2' key. Go to station and stay there
2. Restart: equivalent to 'On' key at station. Resume operation
3. TimerOff: temporarily disables timers (equivalent to Option 15 checked)
4. TimerOn: re-enables timers (equivalent to Option 15 unchecked)

Anti-theft security

1. SetFence: to define a zone outside of which the robot sends a warning
2. NoFence: to suppress the secured zone

Track & Trace

Features. List of commands – Multi zone applications

Taking control of robot operation on Multiple Zones

1. DisableZone X (X=A,B or C) : Robot not allowed to work on Zone X (equivalent to Option 17 unchecked)
2. EnableZone X (X=A,B or C) : Robot allowed to work on Zone X (equivalent to Option 17 checked)
3. TimerOff X (X=A,B or C) : same as TimerOff but applies to specified zone only
4. TimerOn X (X=A,B or C) : same as TimerOn but applies to specified zone only



Configuring Phone Numbers

- Configuring Phone Numbers : **First step to do at Installation**
 - **AlarmPhone1&2** : Defines Alarm_Phone Number – Can be sent from any phone except if Alarm_Phone already set. Alarm_Phone is set to the Calling Number
 - **ClearAlarmPhone1&2** : Clears Alarm_Phone number – Effective only if sent from the Alarm_Phone
 - **CtrlPhone** : Defines Control_Phone Number – Can be sent from any phone except if Control_Phone already set. Control_Phone (and Alarm_Phone if not yet defined) is set to the Calling Number
 - **ClearCtrlPhone** : Clears Control_Phone Number – Effective only if
 - Sent by the Alarm_Phone
 - Or Sent by the Control_Phone and Alarm_Phone is not defined
- **Confirmation SMS is always sent** to the Calling Number (except if communication problem or ‘T&T module’ battery discharged)

Defining authorized users and corresponding rights
AlarmPhone and CtrlPhone privileges

	AlarmPhone1&2	ControlPhone	Other phones
Obtaining information	Yes	Yes	Yes
Taking control of robot	Yes	Yes	No
Anti-theft security	Yes	No	No
Receiving Alarm SMS	Yes	No	No

- **Confirmation SMS is always sent** to the Calling Number
 - except if GPRS communication problem or ‘T&T module’ battery discharged (which will happen few days after Robot if Robot going off for Low Battery Level and not in Charge Station)



Configuring Phone Numbers



← **'Status'** command sent from any phone

Robot answering:

- ID = Unique IMEI robot identification number
- Phone1 Empty: ALARM_PHONE has not yet been configured
- Phone2 Empty: CONTROL_PHONE has not yet been configured
- Robot = 1: Robot is switched on
- Rev = 4.1: 'Track&Trace' FW revision number

← **'WarmPhone'** command sent from SIM card '+32496572551'

→ Robot answering confirmation that Phone1 (ALARM_PHONE) has been set



← **'Status'** command sent from 'ALARM_PHONE'.

Robot answering confirmation that Phone2 (CONTROL_PHONE) has been set. In the meantime, the robot has also switched off (Robot=0).

→

← **'Clearctrlphone'** command sent from 'ALARM_PHONE'.

Robot answering confirmation that Phone2 (CONTROL_PHONE) has been cleared.

→

← **'Clearalarmphone'** command sent from 'ALARM_PHONE'.

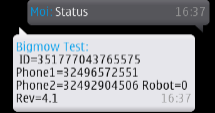
Robot answering confirmation that Phone1 (ALARM_PHONE) has been cleared.



Page 23



Obtaining Information

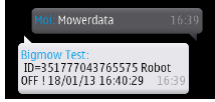
- **Status :**

 - ID = unique identification number of the 'Track&Trace' module embedded in the robot (IMEI)
 - Phone1 = phone number of the ALARM_PHONE
 - Phone2 = phone number of the CONTROL_PHONE
 - Robot = 0 (Robot switched-off) or 1 (Robot switched on)
 - Rev = revision number of the 'Track&Trace' FW
- **Position :**

 - Answers with last valid GPS position and time
 - And GoogleMap Link
- **MowerData :** History Log sent to Track&Trace server if the Robot is not switched off

Success :



Fails :





Page 24

Taking control of robot operation

BackHome, Restart, Timer Off and Timer On SMS commands

Control commands must be sent by AlarmPhone or CtrlPhone mobiles to be effective. Acknowledgement SMS are sent to both the command sender and the usual alarm receiver

Backhome

- Identical to 'F2' key on robot keyboard: go to docking station and stay there till further notice

Restart

- Identical to 'On' key on robot keyboard when the robot is at the docking station
- Can be used to quit manual charge for robots model 2013 onwards

TimerOFF [X]

- Disable timers i.e allows the robot to work all the time in zone X (all if none specified)

TimerON [X]

- Re-enables timers i.e prevents the robot to work on zone X (all if none specified) during programmed rest periods



Taking control of robot operation

EnableZone / DisableZone

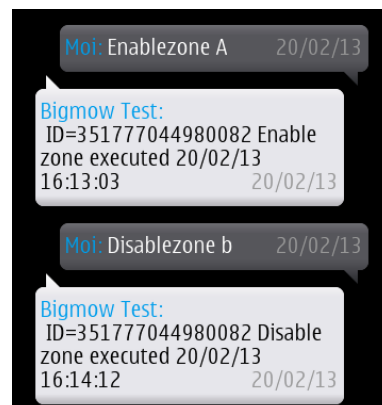
In MultiZone operation

DisableZone X (X=A,B or C)

- The robot will no longer work in Zone X
- Equivalent to disabling Zone via option 17

EnableZone X (X=A,B or C)

- Clear the effect of the previous command
- Equivalent to enabling Zone via option 17



Track & Trace

Theft security

Put the robot in the middle of its working zone and send command

SetFence <W> <H>

- To define a virtual security fence out of which the user gets a warning SMS.
(W=H=300 m if not defined)

Moi: Setfence <20> <5>
22/01/13

Bigmow Test:
ID=351777043765575 Fence
center set to
<http://maps.google.com/maps?q=50.73389,4.58814&spn=0.05636,0.011996&t=k&hl=en>
width=20m height=5m
22/01/13

Bigmow Test:
ID=351777043765575 ! OUT OF
ZONE ! 22/01/13 15:37:07
22/01/13

Page 27

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4	Streamline T&T Server

Page 28



Communication

Belrobotics Track & Trace

Communication

Belrobotics Track & Trace

←
trace.yourstreamline.com/dashboard




[Map](#)


[Manage](#)


[Reports](#)


[Logout](#)

Dashboard

Welcome Mr. Freund

Copyright 2012 StreamLine



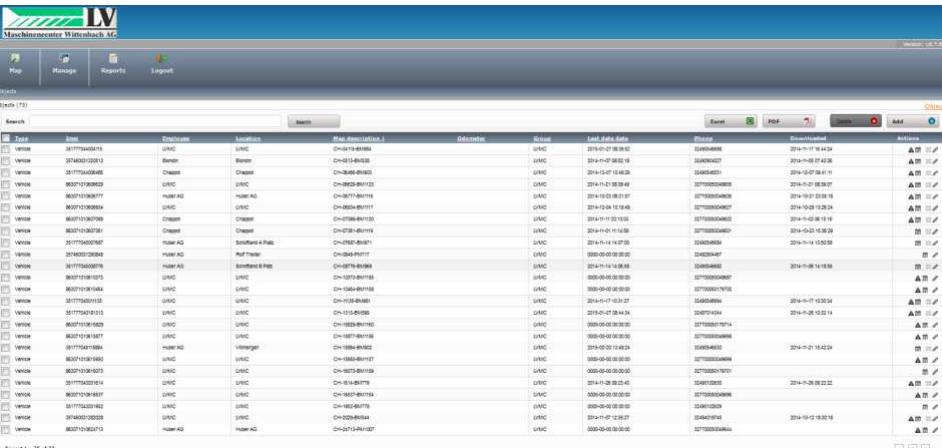
Page 29



Track & Trace

Communication

Belrobotics Track & Trace



The screenshot shows the Belrobotics Track & Trace web application. At the top, there's a navigation bar with icons for Home, Reports, and Login. Below this is a search bar and a table of data. The table has columns for ID, Item, Description, Location, Value, Date, and Action. The data rows show various items like '301770000001', '301770000002', etc., with their respective descriptions and locations. The interface is clean and professional, with a green and white color scheme.



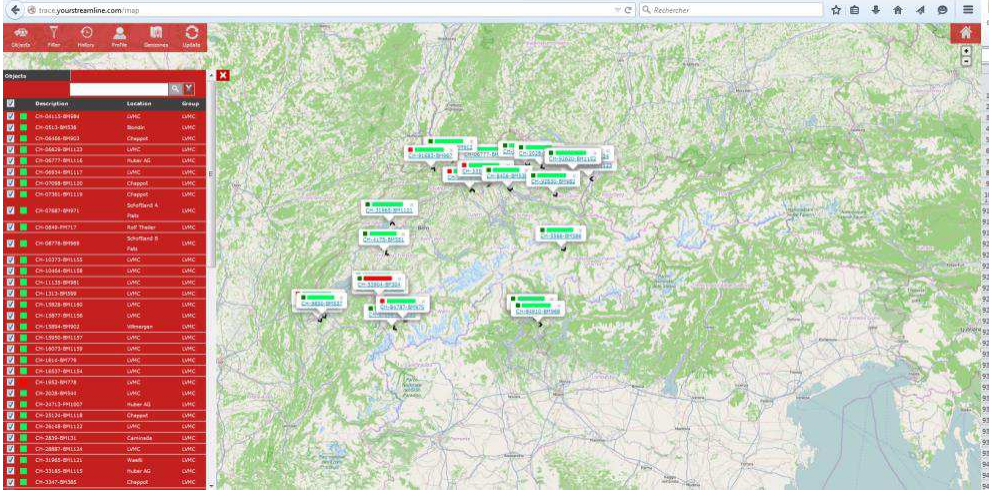
BELROBOTICS
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Page 30



Communication

Belrobotics Track & Trace



Description	Location	Group
CH-0013-00104	L	L
CH-0013-00105	L	L
CH-0013-00106	L	L
CH-0013-00107	L	L
CH-0013-00108	L	L
CH-0013-00109	L	L
CH-0013-00110	L	L
CH-0013-00111	L	L
CH-0013-00112	L	L
CH-0013-00113	L	L
CH-0013-00114	L	L
CH-0013-00115	L	L
CH-0013-00116	L	L
CH-0013-00117	L	L
CH-0013-00118	L	L
CH-0013-00119	L	L
CH-0013-00120	L	L
CH-0013-00121	L	L
CH-0013-00122	L	L
CH-0013-00123	L	L
CH-0013-00124	L	L
CH-0013-00125	L	L
CH-0013-00126	L	L
CH-0013-00127	L	L
CH-0013-00128	L	L
CH-0013-00129	L	L
CH-0013-00130	L	L
CH-0013-00131	L	L
CH-0013-00132	L	L
CH-0013-00133	L	L
CH-0013-00134	L	L
CH-0013-00135	L	L
CH-0013-00136	L	L
CH-0013-00137	L	L
CH-0013-00138	L	L
CH-0013-00139	L	L
CH-0013-00140	L	L
CH-0013-00141	L	L
CH-0013-00142	L	L
CH-0013-00143	L	L
CH-0013-00144	L	L
CH-0013-00145	L	L
CH-0013-00146	L	L
CH-0013-00147	L	L
CH-0013-00148	L	L
CH-0013-00149	L	L
CH-0013-00150	L	L

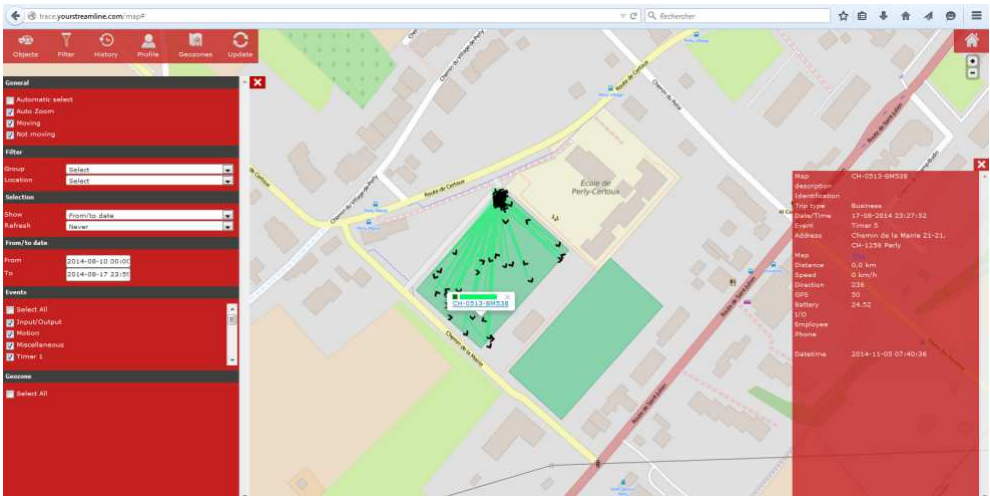


Page 31



Communication

Belrobotics Track & Trace



General

☐ Automatic select

☐ Auto Zoom

☐ Roving

☐ Not moving

Filter

Group: Select

Location: Select

Selection

Show: From/to date

Refresh: Refresh

From/to date

From: 2014-08-10 00:00

To: 2014-08-17 23:59

Events

☐ Select All

☐ Input/Output

☐ Action

☐ Miscellaneous

☐ Timer 1

Scenes

☐ Select All

Map

CH-0013-00150

Map Type: Business

Scale/Time: 1:00-01:00 23:07:52

Location: 23:07:52

Address: 23:07:52

Map: 23:07:52

Distance: 0.0 km

Speed: 0 km/h

Direction: 23:07:52

Alt: 23:07:52

Battery: 24.52

GPS: 23:07:52

Employee: 23:07:52

Phone: 23:07:52

Datetime: 2014-11-05 07:40:06



Page 32

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Page 33