Starcraft Environment Manual

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Chapter 1

Percepts

This section will list all the percepts that are usable in the Starcraft environment. The percepts vary per unit, for example: an attacking unit will not percept the amount of resources available to the player as he does not need them. For the implementation of these percepts in your GOAL code, please refer to the GOAL manual.

1.1 Percepts for all units

These percepts are available to all the units and buildings.

1.1.1 Generic unit percepts

Idle percept

Description	If this percept is perceived, this unit is currently idling.
Type	Send on change
Syntax	idle
Parameters	This percept has no parameters.

ID percept

Description	The ID of this unit, ID's are unique.
Type	Send once
Syntax	id(<ID>)
Parameters	<ID>: The id of this unit, this is a numeral value.

Unit type percept

Description	The Type of this unit, for example "Terran Marine".
Type	Send once
Syntax	unitType(<Type>)
Parameters	<Type>: The type of this unit, this is a string value.

Is being constructed percept

Description	If this percept is perceived, this unit is not yet ready.
Type	Send on change
Syntax	isBeingConstructed
Parameters	This percept has no parameters.

Position percept

Description	The position of this unit in the world.
Type	Send on change
Syntax	position(<X>,<Y>)
Parameters	<X>: The X value of the position in the world. <Y>: The Y value of the position in the world.

Build tile position percept

Description	The position of the build tile this unit is currently standing on.
Type	Send on change
Syntax	buildTilePosition(<X>,<Y>)
Parameters	<X>: The X value of the build tile position in the world. <Y>: The Y value of the build tile position in the world.

1.1.2 Map percepts

Map percept

Description	Percepts the width and the height of the map.
Type	Send once
Syntax	map(<Width>,<Height>)
Parameters	<Width>: The width of the map. <Height>: The height of the map.

Base percept

Description	Percepts the base locations present on the map.
Type	Send once
Syntax	base(<X>,<Y>,<IsStart>,<RegionID>)
Parameters	<X>,<Y>: The coordinates of the baselocation. <IsStart>: 'true' when the location is a starting point, else 'false'. <RegionID>: The ID of the region this location is in.

Chokepoint percept

Description	Percepts the chokepoints present on the map.
Type	Send once
Syntax	chokepoint(<X>,<Y>)
Parameters	<X>,<Y>: The coordinates of the chokepoint.

1.1.3 Enemy percepts

Enemy percept

Description	Percepts the enemies that are currently visible to the player.
Type	Send on change
Syntax	enemy(<Name>,<ID>,<Health>,<Shields>,<WX>,<WY>,<BX>,<BY>)
Parameters	<Name>: The name of the unit. <ID>: The ID of the unit. <Health>: The health of the unit. <Shields>: The amount of shield of the unit. <WX>,<WY>: The world coordinates of the unit. <BX>,<BY>: The build tile coordinates of the unit.

1.1.4 Player unit percepts

Friendly percept

Description	Percepts all the friendly units.
Type	Send on change
Syntax	friendly(<Name>,<Type>,<ID>,<Health>,<Shields>,<WX>,<WY>,<BX>,<BY>
Parameters	<Name>: The agent name of the unit. <Type>: The type of the unit. <ID>: The ID of the unit. <Health>: The health of the unit. <Shields>: The amount of shield of the unit. <WX>,<WY>: The world coordinates of the unit. <BX>,<BY>: The build tile coordinates of the unit.

Loadable percept

Description	Percepts if a friendly unit is loadable.
Type	Send on change
Syntax	friendly(<Name>,<Type>,<ID>)
Parameters	<Name>: The agent name of the unit. <Type>: The type of the unit. <ID>: The ID of the unit.

1.2 Building percepts

These percepts are available to buildings.

1.2.1 Available Resources

Minerals percept

Description	Percepts the amount of minerals currently available to the player.
Type	Send on change
Syntax	minerals(<Quantity>)
Parameters	<Quantity>: The amount of minerals available.

Gas percept

Description	Percepts the amount of gas currently available to the player.
Type	Send on change
Syntax	gas(<Quantity>)
Parameters	<Quantity>: The amount of gas available.

Supply percept

Description	Percepts the amount of supply used and the maximum amount of supply. NOTE: supply is multiplied by 2, so 10 supply in game corresponds with 20 supply in the environment.
Type	Send on change
Syntax	supply(<Current>,<Max>)
Parameters	<Current>: The amount of supply currently in use. <Max>: The maximum amount of supply that is available at this moment.

1.2.2 Queue size

Queue size percept

Description	The queue size of the building, this indicates how many units are currently being build by this building.
Type	Send on change
Syntax	queueSize(<Quantity>)
Parameters	<Quantity>: The amount of units currently being trained.

1.2.3

Build unit percept

Description	The id of the unit that is currently being built by this building.
Type	Send on change
Syntax	buildUnit(<ID>)
Parameters	<ID>: The ID of the unit.

1.2.4 Research

Research percept

Description	The name of the tech that is being researched.
Type	Send on change
Syntax	research(<Name>)
Parameters	<Name>: The name of the tech that is being researched.

1.2.5 Upgrade

Upgrade percept

Description	The name of the upgrade that is being upgraded.
Type	Send on change
Syntax	updrade(<Name>)
Parameters	<Name>: The name of the upgrade that is being upgraded.

1.2.6 Rally point

Rally point percept

Description	The position of the rally point.
Type	Send on change
Syntax	rallyPoint(<X>,<Y>)
Parameters	<X>,<Y>: The coordinates of the rally point.

Rally unit percept

Description	The unit the rally point points to.
Type	Send on change
Syntax	rallyUnit(<Unit>)
Parameters	<Unit>: The unit the rally point points to.

1.2.7 Terran building percepts

Lifted percept

Description	This is percepted when this building is lifted.
Type	Send on change
Syntax	lifted
Parameters	This percept does not have any parameters.

Addon percept

Description	This is percepted when a building has an addon.
Type	Send on change
Syntax	addon(<Name>)
Parameters	<Name>: The name of the addon.

1.3 Refinery percepts

These percepts are available to refineries.

1.3.1 Worker activity

Worker activity percept

Description	Information on what workers are currently doing.
Type	Send on change
Syntax	workerActivity(<ID>,<Activity>)
Parameters	<ID>: The ID of the worker. <Activity>: The activity that the worker is currently doing, one of the following: gatheringGas, gatheringMinerals, constructing or idling.

1.4 Attack unit percepts

These percepts are available to units that can attack.

1.4.1 Attacking units

Attacking percept

Description	Indicates which units are the targets of friendly units.
Type	Send on change
Syntax	attacking(<ID>,<TargetID>)
Parameters	<ID>: The ID of a friendly unit. <TargetID>: The ID of the enemy unit that the friendly unit is attacking.

1.5 Moving unit percepts

These percepts are available to units that can move when built, so not terran flying buildings for example.

1.5.1 Loaded units

loaded percept

Description	Indicates whether or not a unit is loaded in a loadable unit.
Type	Send on change
Syntax	loaded
Parameters	This percept does not have any parameters.

1.5.2 Moving units

move percept

Description	Indicates that a unit is moving.
Type	Send on change
Syntax	moving
Parameters	This percept does not have any parameters.

1.6 Worker percepts

These percepts are available to SCV's.

1.6.1 Available Resources

Minerals percept

Description	Percepts the amount of minerals currently available to the player.
Type	Send on change
Syntax	minerals(<Quantity>)
Parameters	<Quantity>: The amount of minerals available.

Gas percept

Description	Percepts the amount of gas currently available to the player.
Type	Send on change
Syntax	gas(<Quantity>)
Parameters	<Quantity>: The amount of gas available.

Supply percept

Description	Percepts the amount of supply used and the maximum amount of supply. NOTE: supply is multiplied by 2, so 10 supply in game corresponds with 20 supply in the environment.
Type	Send on change
Syntax	supply(<Current>,<Max>)
Parameters	<Current>: The amount of supply currently in use. <Max>: The maximum amount of supply that is available at this moment.

1.6.2 Builder unit

Constructing percept

Description	Percepts whether of not this unit is constructing.
Type	Send on change
Syntax	constructing
Parameters	This percept does not have any parameters

1.6.3 Gatherer unit

Carrying percept

Description	Percepts whether of not this unit is carrying resources.
Type	Send on change
Syntax	carrying
Parameters	This percept does not have any parameters

Gathering percept

Description	Percepts if the unit is gathering and what the unit is gathering.
Type	Send on change
Syntax	gathering(<Resource>)
Parameters	<Resource>: The resource that is being gathered, either 'vespene' or 'mineral'.

Gathering percept (Other unit)

Description	Percepts if another unit is gathering and what the other unit is gathering.
Type	Send on change
Syntax	gathering(<ID>,<Resource>)
Parameters	<ID>: The ID of the unit. <Resource>: The resource that is being gathered, either 'vespene' or 'mineral'.

Vespene geyser percept

Description	Percepts a vespene geyser on the map.
Type	Send on change
Syntax	vespeneGeyser(<ID>,<Resources>,<ResourceGroup>,<X>,<Y>)
Parameters	<ID>: The ID of the geyser. <Resources>: The amount of resources left in the geyser. <ResourceGroup>: The resource group. <X>,<Y>: The coordinates of the geyser, a refinery can be built at this position.

1.7 Transporter percepts

These percepts are available to units with transport capabilities.

1.7.1 Transporter

Space provided percept

Description	Information about the maximum transport capacity and the current load.
Type	Send on change
Syntax	spaceProvided(<Used>,<Max>)
Parameters	<Used>: The amount of units this vehicle is currently carrying. <Max>: The maximum carrying amount of this vehicle.

Unit loaded percept

Description	Information about the units that are currently inside this vehicle.
Type	Send on change
Syntax	unitLoaded(<ID>,<Type>)
Parameters	<ID>: The ID of the unit. <Type>: The type of the unit.

1.8 Command center percepts

These percepts are available to command centers.

1.8.1 Idle workers

Idle worker percept

Description	Lists the workers that are idle.
Type	Send on change
Syntax	idleWorker(<Name>)
Parameters	<Name>: The name of the unit.

1.8.2 Worker activity

Worker activity percept

Description	Information on what workers are currently doing.
Type	Send on change
Syntax	workerActivity(<ID>,<Activity>)
Parameters	<ID>: The ID of the worker. <Activity>: The activity that the worker is currently doing, one of the following: gatheringGas, gatheringMinerals, constructing or idling.

1.9 Unit specific percepts

1.9.1 Terran marine/firebat

Stimmed percept

Description	Perceived if the marine or firebat is under the effect of a stim pack.
Type	Send on change
Syntax	stimmed
Parameters	This percept has no parameters

1.9.2 Terran siege tank

Siege percept

Description	Perceived if the siege tank is in siege mode.
Type	Send on change
Syntax	sieged
Parameters	This percept has no parameters

Chapter 2

Actions

This section will list all the actions that are usable in the Starcraft environment.

2.1 Attack action

Desription	Attack a unit or building.
Syntax	attack(<TargetID>)
Parameters	<TargetID>: The ID of the target that has to be attacked.
Effects	If the unit is attack capable, attack the target.

2.2 Attack move action

Desription	Go to a location and attack everything you encounter.
Syntax	attack(<X>,<Y>)
Parameters	<X>,<Y>: The coordinates to move to.
Effects	Go to a location and attack every enemy encountered if a unit can move and is attack capable.

2.3 Upgrade action

Desription	Upgrade an upgrade.
Syntax	upgrade(<UpgradeName>)
Parameters	<UpgradeName>: The name of the upgrade you want to upgrade.
Effects	Buy an upgrade.
NOTE	At the moment this is only possible with the terran engineering bay and terran academy.

2.4 Build action

Desription	Build a building.
Syntax	build(<Type>,<X>,<Y>)
Parameters	<Type>: The Type of the building that has to be built. <X>,<Y>: The coordinates to build on.
Effects	Build a building at the location specified if this unit is capable to do so.

2.5 Gather action

Desription	Instruct a unit to gather a resource.
Syntax	gather(<ID>)
Parameters	<ID>: The ID of the resource to gather.
Effects	The unit starts gathering the resource if this unit is capable to do so.

2.6 Move action

Desription	Instruct a unit to move to a location.
Syntax	move(<X>,<Y>)
Parameters	<X>,<Y>: The coordinates to move to.
Effects	Go to a location if a unit can move.

2.7 Train action

Desription	Train a unit from a building.
Syntax	train(<Type>)
Parameters	<Type>: The type of unit to train.
Effects	If a unit can be built from this building, train the unit if there are enough resources.

2.8 Stop action

Desription	Stop a unit.
Syntax	stop
Effects	Stops this unit from doing what he is doing.

2.9 Use action

Desription	Use a technology.
Syntax	use(<Type>)
Parameters	<Type>: The type of technology to use.
Effects	If this unit can use the tech and it is researched, use the technology.

2.10 Use on target action

Desription	Use a technology on a target.
Syntax	use(<Type>, <Target>)
Parameters	<Type>: The type of technology to use. <Target>: The target to use the technology on.
Effects	If this unit can use the tech and it is researched, use the technology on the target.

2.11 Use on location action

Desription	Use a technology on a location.
Syntax	use(<Type>, <X>, <Y>)
Parameters	<Type>: The type of technology to use. <X>,<Y>: The coordinates to use the technology on.
Effects	If this unit can use the tech and it is researched, use the technology on the location.

2.12 Research action

Desription	Research a technology.
Syntax	research(<Type>)
Parameters	<Type>: The type of technology to research.
Effects	If this building can research this tech, research the technology.

2.13 Set rally point action

Desription	Set the rally point of a building.
Syntax	setRallyPoint(<X>, <Y>)
Parameters	<X>,<Y>: The coordinates to set the rally point to.
Effects	If this unit can set a rally point, set it to the specified location.

2.14 Set rally point to unit action

Desription	Set the rally point of a building.
Syntax	setRallyPoint(<Unit>)
Parameters	<Unit>: The unit to set the rally point to.
Effects	If this unit can set a rally point, set it to the specified unit.

2.15 Lift action

Desription	Lift a building.
Syntax	lift
Effects	The building starts flying.
Note	Only for Terran buildings.

2.16 Land action

Desription	Land the unit.
Syntax	land(<X>, <Y>)
Parameters	<X>,<Y>: The coordinates to land on.
Effects	If the unit is lifted, land the unit on the location.
Note	The location has to be visible.

2.17 Siege action

Desription	Order a tank to go in siege mode.
Syntax	siege
Effects	The tank enters siege mode.
Note	Only for Terran Siege Tank.

2.18 Unsiege action

Desription	Order a tank to go out of siege mode.
Syntax	unsiege
Effects	The tank exits siege mode.
Note	Only for Terran Siege Tank.

2.19 Build addon action

Desription	Order a building to build an addon.
Syntax	buildAddon(<Name>)
Effects	The building builds an addon
Note	Only for Terran buildings.

Chapter 3

TechTypes

Here is a list of technology types that can be researched and used.

Stim Packs
Lockdown
EMP Shockwave
Spider Mines
Scanner Sweep
Tank Siege Mode
Defensive Matrix
Irradiate
Yamato Gun
Cloaking Field
Personnel Cloaking
Burrowing
Infestation
Spawn Broodlings
Dark Swarm
Plague
Consume
Ensnare
Parasite
Psionic Storm
Hallucination
Recall
Stasis Field
Archon Warp

Restoration
Disruption Web
Mind Control
Dark Archon Meld
Feedback
Optical Flare
Maelstrom
Lurker Aspect
Healing

Chapter 4

UpgradeTypes

Here is a list of upgrade types that can be researched.

Terran Infantry Armor
Terran Vehicle Plating
Terran Ship Plating
Zerg Carapace
Zerg Flyer Carapace
Protoss Ground Armor
Protoss Air Armor
Terran Infantry Weapons
Terran Vehicle Weapons
Terran Ship Weapons
Zerg Melee Attacks
Zerg Missile Attacks
Zerg Flyer Attacks
Protoss Ground Weapons
Protoss Air Weapons
Protoss Plasma Shields
U 238 Shells
Ion Thrusters
Titan Reactor
Ocular Implants
Moebius Reactor
Apollo Reactor
Colossus Reactor
Ventral Sacs

Antennae
Pneumatized Carapace
Metabolic Boost
Adrenal Glands
Muscular Augments
Grooved Spines
Gamete Meiosis
Metasynaptic Node
Singularity Charge
Leg Enhancements
Scarab Damage
Reaver Capacity
Gravitic Drive
Sensor Array
Gravitic Boosters
Khaydarin Amulet
Apial Sensors
Gravitic Thrusters
Carrier Capacity
Khaydarin Core
Argus Jewel
Argus Talisman
Caduceus Reactor
Chitinous Plating
Anabolic Synthesis
Charon Boosters